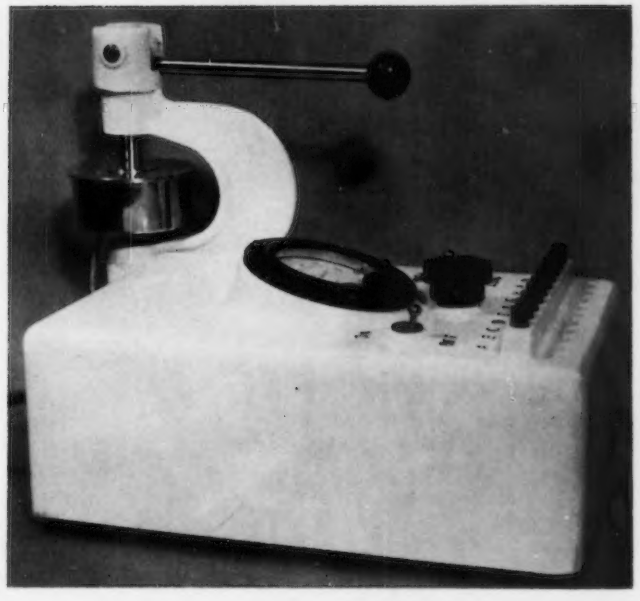
January 20, 1958

Paper Trade Journal

- Rayonier's New Jesup Mill
- Evaporating NSSC Waste Liquors
- Russian Pulp and Paper Industry
- Groundwood Screening Methods
- Pulp, Paper and Board Outlook

University Microfilms
Att: E B Power
313 N First St.
Ann Arbor, Mich.



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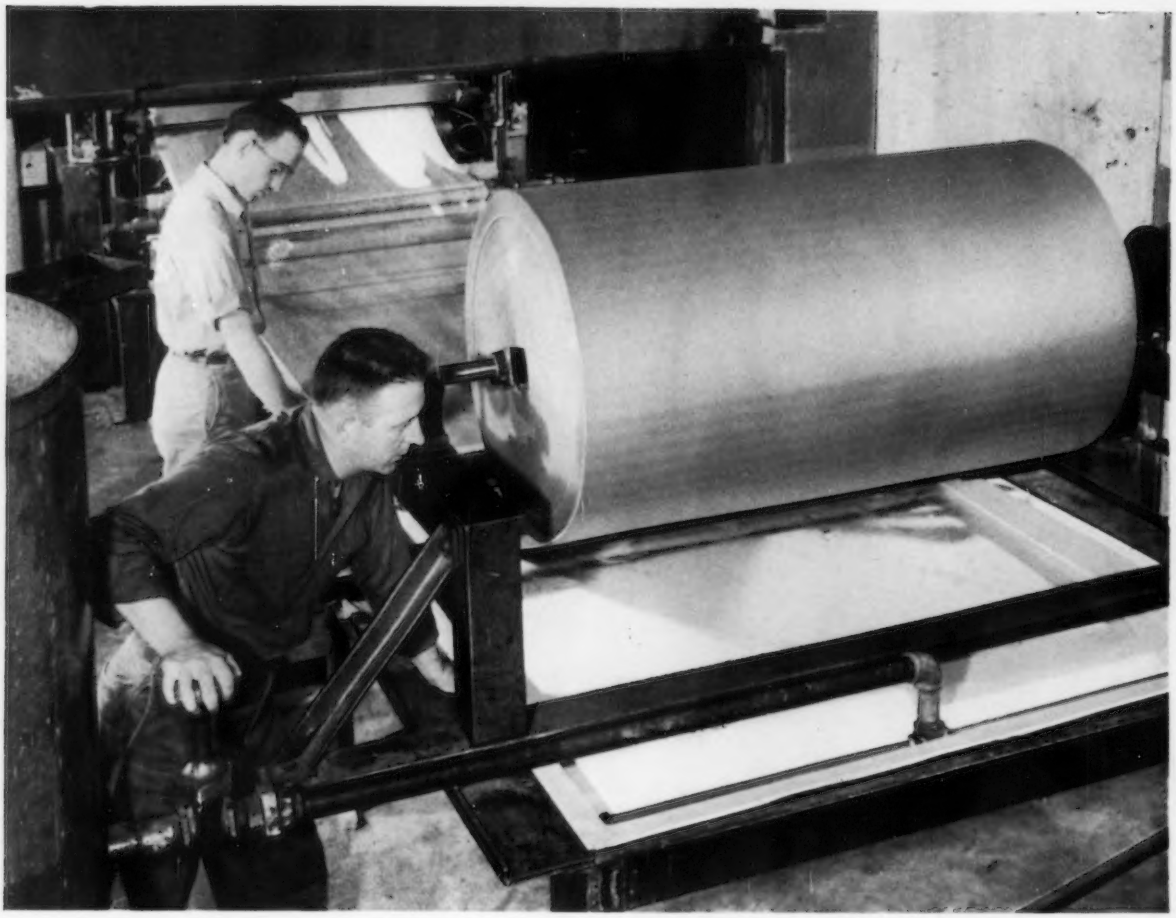

What's the Score on Off-Machine Saturation?

More and more manufacturers are turning to off-machine saturation as a low-cost means of improving various papers. And many of them are finding CHEMIGUM LATEX the ideal saturant.

Pictured above is a case in point. The product involved is sheet gasketing. By saturating the cork paper base with CHEMIGUM LATEX, its manufacturer put an end to shrinkage in storage or in service against water. He also greatly improved its strength, resilience, compressibility and resistance to heat, gasoline and oil. Moreover, he made these improvements with surprising ease and economy.

Off-machine saturation of sheet gasketing takes advantage of just some of the property improvements that can be imparted to a variety of stocks by the addition of CHEMIGUM LATEX. Others include: Better feel and drape, higher internal and edge tear, and added burst strength. Typical applications include: Shoe insoles and midsoles, tapes and coated artificial leather.

If you are interested in improving your situation on off-machine saturation, why not get the full story on CHEMIGUM LATEX. Just write for details, including the latest *Tech Book Bulletins*, to Goodyear, Chemical Division, Akron 16, Ohio.

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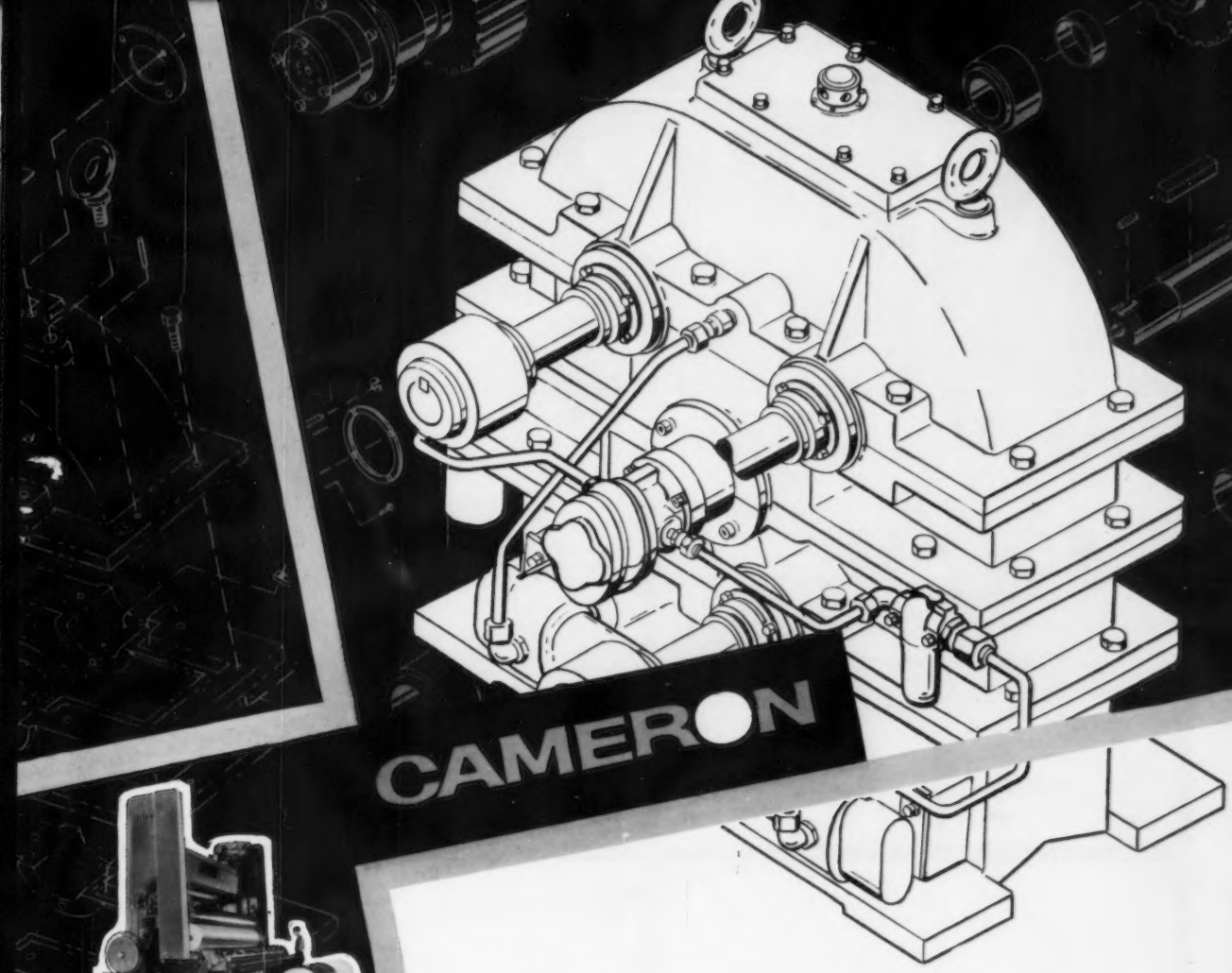

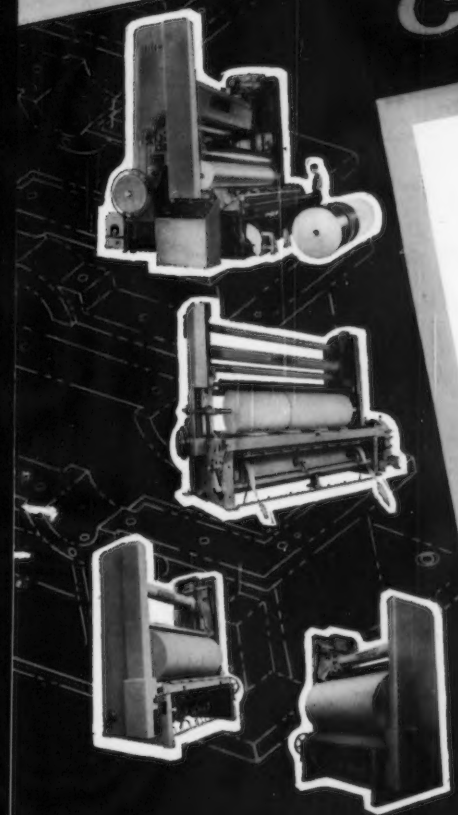

CAMERON'S ISOLATED GEAR BOX, with forced feed lubrication and flexible couplings, presents another example of the *inward excellence* of Cameron winder design. Gears of the main drive assembly are isolated from deflection of the rewind drums while, at the same time, vibration is separated from the driven rotating elements. The advantages are in longer gear life and superior web control at higher operating speeds.

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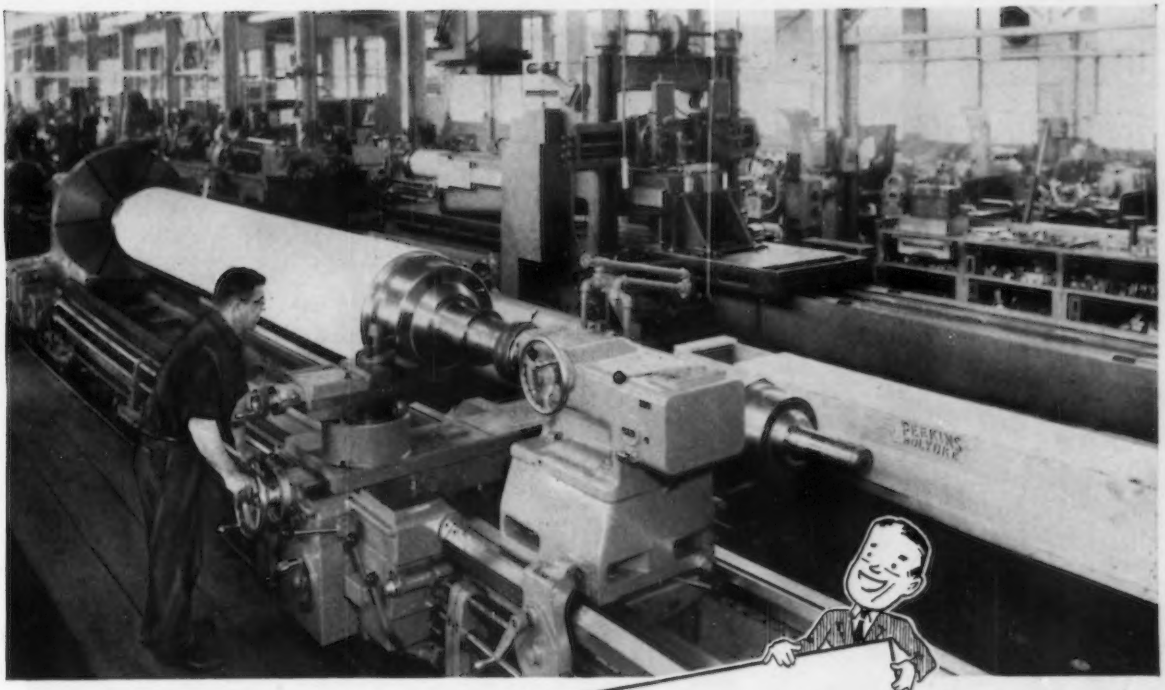

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Making Perkins quality calender rolls requires highly skilled operators as well as the most modern equipment. Here is Joe Yacovone finishing a 24" diameter 175" face roll, one of the last of the many steps taken all the way from initial engineering to the finished product. Joe knows that Perkins rolls must be machined exactly and he knows how to do it. We are proud of Joe and many others like him in our organization.

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REMEMBER THESE DATES . . .

JAN. 23: Western Michigan University's Annual Pulp & Paper Conference, Kalamazoo, Mich.

JAN. 29-31: Canadian Pulp & Paper Assn. Annual Meeting at Mount Royal Hotel, Montreal, Canada.

FEB. 16-21: Paper Week in New York.

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Published Weekly Since 1872

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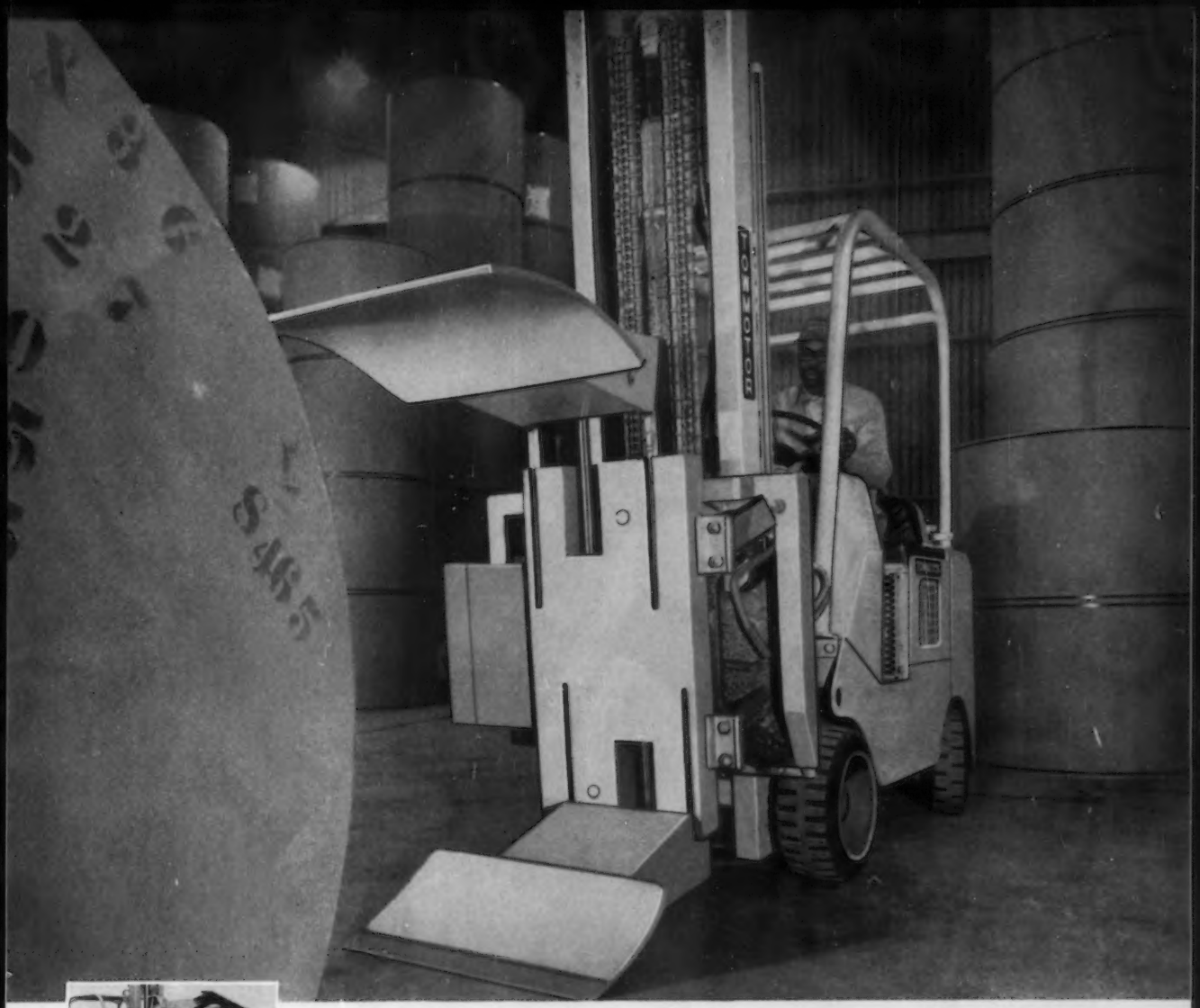

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"Pace-Maker" Series Model 540 is typical of new fork lift trucks in the combined Towmotor-Gerlinger line. Load capacities from 1500 to 40,000 pounds.

Driving Ease More Than Tripled with new Towmotor power steering! TowmoTorque Drive adds cushioned "creep" control unequalled in the industry today.

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Fingertip-controlled accessories like this—combined with new Towmotor "no-loss" hydraulic power—will clamp, lift, revolve and position rolls, bales, barrels, drums and other loads for accurate, systematic handling.

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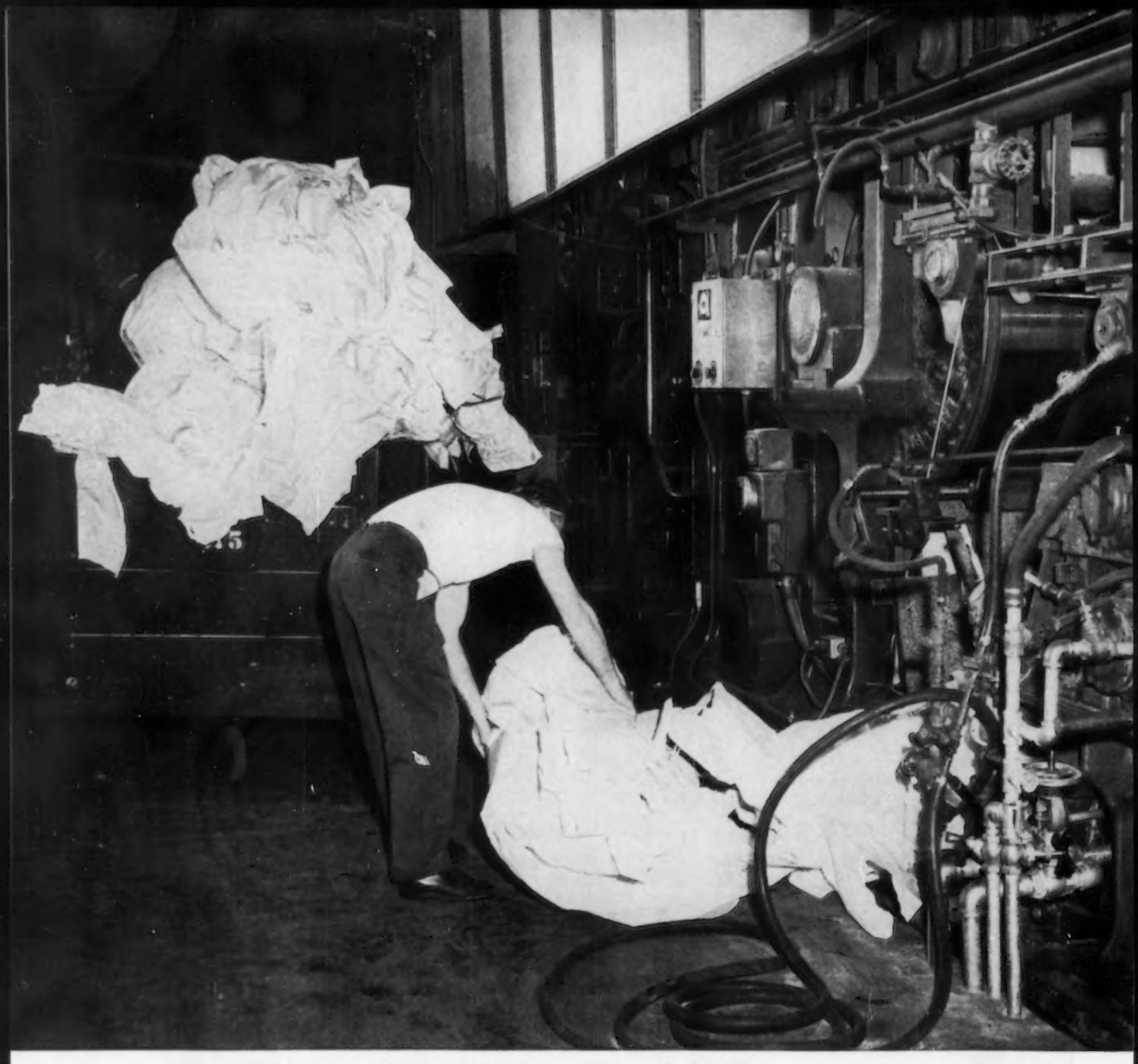

you can reprocess the "broke"...
...but the time is lost forever

Back to the beaters goes the "broke" caused by a break in the paper web, and nothing is lost . . . nothing but TIME, that precious element of production. The time spent in carrying the paper making process to the point at which the break occurred, the time spent in clearing the machine, in cutting another tail and in correcting the cause of the break is lost . . . forever. The only cure for lost time is prevention, and a step in the right direction is standardization on Stowe-Woodward rubber covered rolls, developed and built by experts in increasing production and reducing paper machine down-time.

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RUBBER ROLLS with a REPUTATION

TRENDS

JANUARY 20, 1958

Early January—Like December

Now available, indexes of general business activity, including paper and board production for the first half of January, indicate little change up or down over December operations.

Optimistic Outlook for 1958

An optimistic outlook for our industry in 1958 by the U. S. Dept. of Commerce is reported in an article by W. L. Neubrech in this issue. On the assumption that the total economy will be maintained or advance slightly in 1958, he predicts a 3 to 5% increase in United States production of paper and board.

1957 Board Trends by Grades

First detailed figures on paperboard production for 1957 by the National Paperboard Assn. reveal the following trends—Total production declined slightly under 1%; Liner off 3%; Corrugating off 3%; Chip and filler board off 10%; Folding up 4%; Set-up off 12%; Special food board up 3%; All other grades up 3%.

Annual Survey — Mixed Indications

Highlights of the U. S. Dept. of Commerce annual survey of major industries prospects are presented here: General construction up 5%—Housing up 4%—Lumber up 5%—Iron and steel off 3 to 5%—Automobiles and trucks off 2 to 5%—Machine tools off 20-25%—Electrical equipment up something less than 4%—Textiles little change—Corrugated shipping containers slight rise—Printing and publishing, an increase is looked for in newspapers, magazines and books—Pulp, paper and board, an all-time record high 3-5% above 1957.

Improvement for Waste Paper Seen

An improvement in operations for waste paper packers in the second half of this year is predicted by Paul White of Great Eastern Packing & Paper Stock Corp. in a year-end statement on page 38.

Looking Into Russian Paper

The Russian pulp and paper industry is behind North America technologically and in spite of present and planned increases in production, paper will still be in short supply. Failure to keep abreast with us in technological development and the inadequate supply of paper appear to be part of a definite policy of the U.S.S.R. to concentrate its efforts in other areas such as sputniks. For further details read the authoritative article on the subject in this issue.

For Top Wet Strength at Low Cost... UFORMITE 711

With all types of pulp—bleached or unbleached kraft, sulfite, or sulfite-groundwood combination—UFORMITE 711 can supply the wet strength you need at the low cost you want.

Paper makers prefer using UFORMITE 711 as their wet strength resin for other reasons as well. They've found that UFORMITE 711 is stable, can be shipped in drums or bulk, and requires no special preparation for use. It is being used in almost every grade of wet strength paper—from bags and butcher wrap to tissue and toweling.

Investigate UFORMITE 711—it may have the features you've been looking for.

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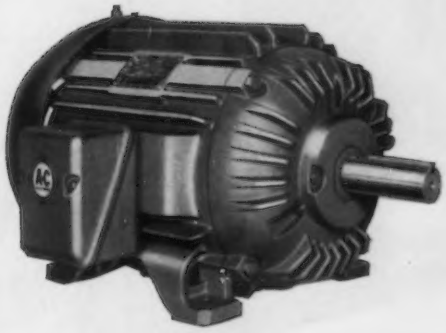

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If you specify "Allis-Chalmers motors or equal"

. . . remember that the "equal" is possible only in two respects: price and nameplate specifications. You can't match the *long-run power* of Allis-Chalmers motors.

Double-shielded bearings guarded against dirt and over-greasing . . . provision for elimination of moisture condensation . . . practically indestructible rotor design . . . more cooling surface . . . more iron and copper content — these are the features (with others) that make up long-run power. These are the features that give Allis-Chalmers motors "plus" performance that can't be equalled.

Find out more about the motors with long-run power from your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

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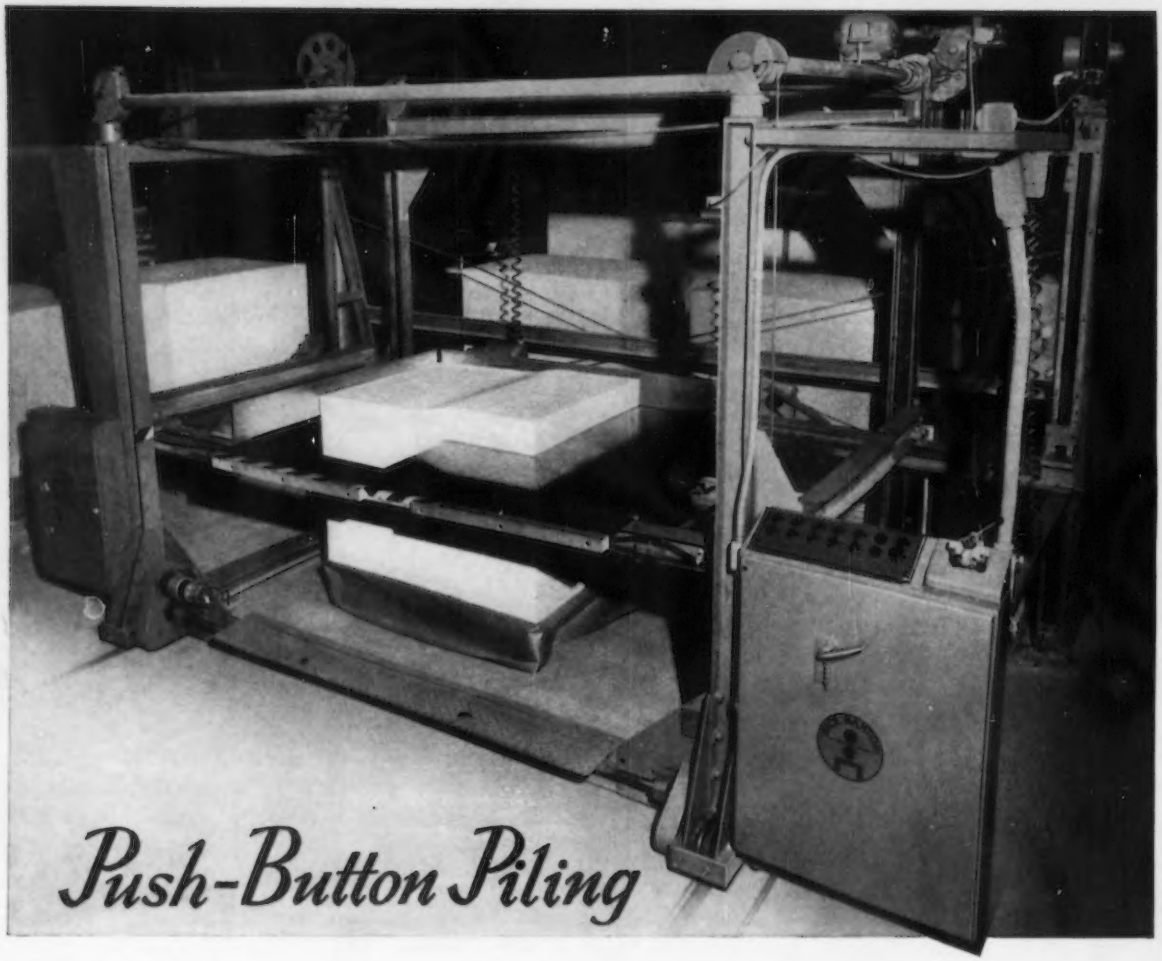
A-5663



You can get maximum trimming efficiency with the Rice Barton Precision Paper Piler.

Actual Finishing Room production records show over 3,300 pounds per man hour (loaded, trimmed and skidded) using a Rice Barton Piler.

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Ecusta Mill Construction on Schedule

The structure for the new building to house the new paper machine at Ecusta Paper Co., Division of Olin Mathieson Chemical Corp., Pisgah Forest, N. C., is proceeding on schedule. More than 70,000 sq. ft. of building will be needed to house the large new paper machine whose production will exceed the production of any of Ecusta's nine other machines. The new construction is poured-in-place concrete with structural steel framing used to support the roof and mezzanine. The floor is concrete slab from 2'3" to 2'6" thick. Work on the superstructure was begun in mid-August and is scheduled for completion during the spring of 1958. Daniel Construction Co. completed the foundations for the new building in June of this year. This work consisted of 1,000 Raymond concrete piles that were driven between 8 ft. and 22 ft.

Production from the nine machines presently in operation is principally for cigarette papers. The new machine will produce lightweight printing papers, one-time carbonizing tissue and other technical papers.

Interstate Container Buys Reading Corr.

Interstate Container Corp., Glendale, Long Island, independent converter of corrugated shipping containers, announced it has purchased all assets of Reading Corrugated Container Corp., paper manufacturer and corrugated converter, of Reading, Pa.

Purchase price was not disclosed, but Saul L. Epstein, Interstate president, said the figure was "well over one million."

Mr. Epstein said all present personnel of the Reading concern will be retained. Louis Fink will head the operation as vice president and general manager.

Interstate said it plans to spend "several hundred thousand dollars" to increase paper production capacity in Reading to 100 tons a day. The acquisition gives Interstate a "measure of control over its primary raw material for the first time" and enables it to "be integrated in more than one-third of its conversion activities," the company said. It also will open up an expanded market for Interstate containers in Pennsylvania, Mr. Epstein said.

The paper mill acquisition will be called Interstate Paper Corp. and the converting plant will be a division of Interstate Container. The parent company also has conversion plants in New Haven, Conn., and Harrison, N. J.

Scott Files Suit Against Hudson

Scott Paper Co. filed suit in U. S. District Court at Jacksonville, Fla. against the Hudson Pulp & Paper Corp. charging patent infringement.

It asked an accounting for profits and damages. No details of the infringement were given except for giving the patent No. 2,418,600 issued on April 8, 1947.

Brewton Mill Making Pulp

Bleached pulp is now being produced at the Brewton, Alabama, mill of Container Corporation of America. The plant is designed ultimately to produce bleached food boards and related grades. It is anticipated that the machine will be started up shortly. Manager of the new plant is D. O. Jennings.

Crofton Mill Being Tuned Up

The new $46 million bleached kraft pulp mill of B. C. Forest Products at Crofton, B. C., has been completed. Trial runs are now being made on the equipment in the various departments.

The majority of the mills in British Columbia have been closed by a two months strike, and it is unlikely that the Crofton mill will get into regular operation until the strike is settled.

Mt. Tom Pulp Mill Project Still Active

Thomas E. Prescott, vice president, Mount Tom Development Corp., present owners of the former Doeskin sulphite pulp mill near Northampton, Mass., stated last week that his company plans to go ahead with revamping of the mill.

Mr. Prescott, who is a retired Passaic, N. J. banker, admitted that the corporation was a holding company and declined to reveal the identity of the principals behind it. He said that the name will eventually be changed to Mount Tom Pulp & Paper Co. Roderick O'Donoghue and Aubrey Taylor, pulp and paper consultants, are listed as officers of the firm.

Plans call for a semichemical pulp mill and the conversion of this to corrugating medium on a fourdrinier machine. Negotiations are under way for purchase of a paper machine.

Hammermill Denies New Mill Report

Hammermill Paper Co. has denied a published report that it plans to begin, in the near future, construction of a paper mill near Franklin, Pa. Hammermill has previously purchased two possible mill sites near Franklin but the company reports that construction of a mill there is "held very much in abeyance at the present time."

Riegel's New Mill to Start in Spring

The new paper mill of Riegel Paper Corp. of Acme, N. C. is expected to be completed this spring. Previously Riegel has operated only a bleached kraft and semichemical pulp mill at Acme. Some 250 tons additional capacity, representing the new paper mill's requirements, have been added to the pulp mill.

Manager of paper production is A. L. M. Bixler, formerly manager of Riegel's New Jersey Upper Mill. Paper mill superintendent is Brookshire Moore who was previously employed with East Texas Pulp & Paper Co., Evadale, Tex.

North Western Near Rated Capacity

"The steadily accelerating sales of Alberta Hi-Brite bleached sulphate pulp proves that a market can always be found for a quality product, even in a period when ample supplies are available," stated Reginald L. Vayo, vice president of St. Regis Paper Co. in commenting upon the company's position with regard to the new pulp mill at Hinton, Alberta, Canada. The mill of North Western Pulp & Power Ltd. is owned jointly by St. Regis and North Canadian Oils Ltd. St. Regis directed the design and construction of the mill, manages its operation and acts as exclusive sales agent for its output.

"In common with many projects," Mr. Vayo said, "particularly when a mill is engineered for top-grade pulp, numerous start-up problems were encountered. However, once quality standards were attained, we pressed production to keep up with customer demand, and the output of the mill is currently approaching its planned capacity of 430 tons a day. It is now evident from our early experience that a larger production will eventually be achieved.

"The future offers good promise that the high grade of bleached sulphate pulp made possible by the fiber inherent in the trees of western Alberta will be in increasing demand. Plans are now under way for expanded sales coverage to offer customer-service requirements for the increased tonnage now being moved," he stated.

The mill produces uniform high-quality pulp from lodgepole pine and white spruce by a new continuous process in Kamyr digesters. This is the world's largest installation of continuous digesters and the first in North America.

U of Maine to Present Honor Award

The University of Maine Pulp and Paper Foundation will present its eighth annual Honor Award when the University of Maine Pulp and Paper Alumni luncheon is held in New York City on February 19.

The luncheon will be held in the Madison Room of the Biltmore Hotel. Frank A. Butler, of the Eastman Kodak Co., Rochester, N. Y., a graduate of Maine in 1951, will be the chairman. Raymond H. Fogler, president of the University of Maine Board of Trustees, will be the speaker.

All University of Maine alumni connected with the pulp and paper and allied industries are invited to the affair which is held annually in conjunction with Paper Week activities in New York.

Japan to Make Synthetic Fiber Paper

Japan will begin pilot production of synthetic paper this spring, using a process developed by the Okamura Technology Laboratory of Kyoto University.

Manufactured by the Special Paper Manufacturing Co. of Shizuoka Prefecture, the paper is to be made from synthetic vinyl fibers. It is said to be especially suited for use as air filters, light-weight food storage packages and paper money.

West Michigan Alumni to Meet

The national annual meeting of the alumni of Paper Technology of Western Michigan University will be held in New York City at the Commodore Hotel on February 18. The meeting will start immediately following a noon luncheon. Guest speaker will be Otto Yutema, director, Division of Field Services, Western Michigan University, Kalamazoo, Mich. Other guests from the executive committee of the paper technology school and Professor Alfred H. Nadelman will also be present.

The present officers of the alumni are as follows:

President: Edward G. DeGalan, A. C. Sparkplug Division G.M.C., Flint, Mich.

Vice President: Wilbur R. Noel, Kalamazoo Paper Co., Kalamazoo, Mich.

Secretary: Virgil W. Westdale, Burroughs Corp., Detroit, Mich.

Treasurer: Gordon Gill, Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending January 4, 1958, was 72.6 per cent compared with 49.4 per cent revised for the preceding week. The ratio was 85.4 per cent for the corresponding week a year ago.

The paperboard production ratio for the week ending January 4, 1958, was 51 per cent compared with 45 per cent for the preceding week and 75 per cent for the corresponding week last year.

(Detailed statistics on page 54).

TAPPI Coating Conference Set for May

The ninth annual TAPPI Coating Conference will be held at the Bedford Springs Hotel, Bedford, Pa., on May 14, 15 and 16.

The program for the conference has almost been completed with only minor changes expected in the four months remaining. Highlights of the conference will be panels on "Coating Formulations" and "Coating Color Rheology."

Statistics Course Slated for Quebec

The seventh statistics course will once again be sponsored jointly by TAPPI and the Technical Section, Canadian Pulp and Paper Association and will, for the second time, be held in Canada. The dates of the course are July 7 to 18, 1958 and the location will be Laval University, Quebec City, P. Q. The course has been held annually for the past six years, once in Canada and five times in the United States.

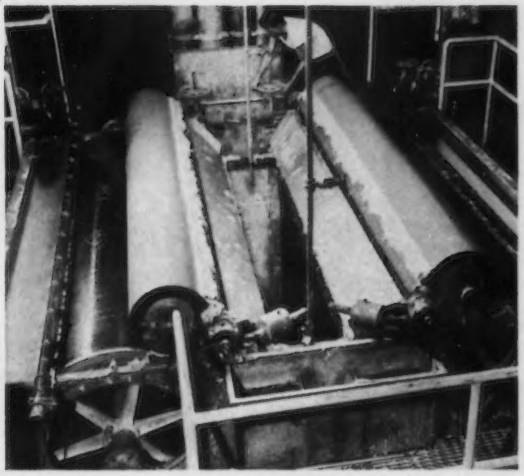
Further details, application forms, etc. may be had by writing Douglas Jones, Technical Section, Canadian Pulp and Paper Association, 2280 Sun Life Building, Montreal 2, Canada.

Canadian Fine Paper Figures for Nov.

Canadian fine paper production in November totalled 21,018 tons, off 2.7 per cent from the year ago figure of 21,607 tons. Shipments for the month were 20,397 tons, of which 18,936 tons went to Canadian consumers and 1,461 tons were exported. In November last year, shipments totalled 20,558 tons including domestic shipments of 18,914 tons and exports of 1,644 tons.

Output to the end of November continued ahead of last year at 234,533 tons as against 229,197 tons. Despite a modest decline in exports for the first eleven months from 15,151 tons in 1956 to 14,853 tons this year, total shipments were also ahead at 232,452 tons as compared with 227,660 tons in 1956. Domestic shipments for the eleven month period were 217,599 tons this year and 212,509 tons in 1956.

In November 2,558 tons of coated paper were produced as against 2,787 tons a year ago. Shipments for the month were 2,452 tons this year and 2,466 tons in November 1956. In the first eleven months, coated paper production was 27,547 tons and shipments were 27,745 tons. For the same period in 1956 coated paper production was 27,001 tons and shipments were 26,755 tons.



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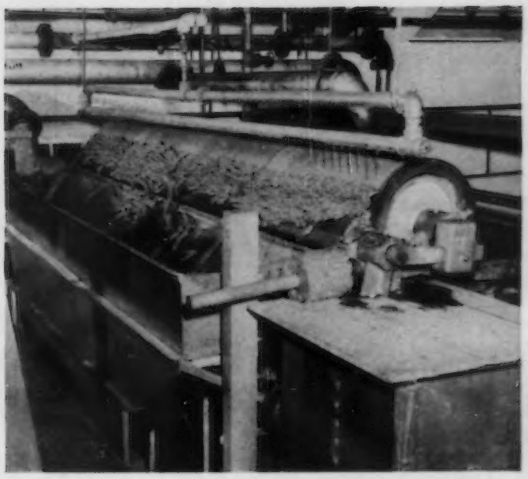

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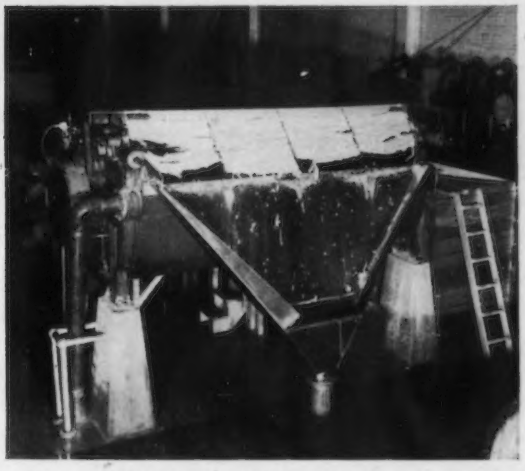

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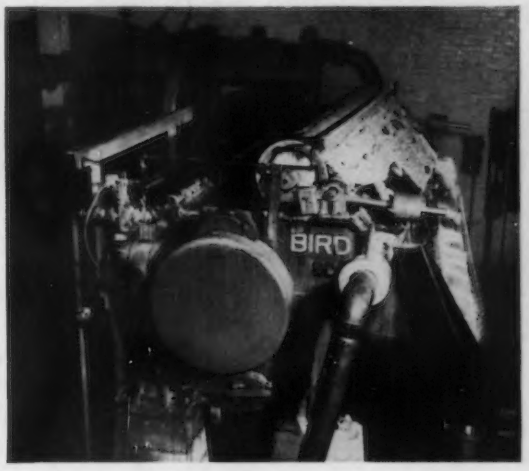

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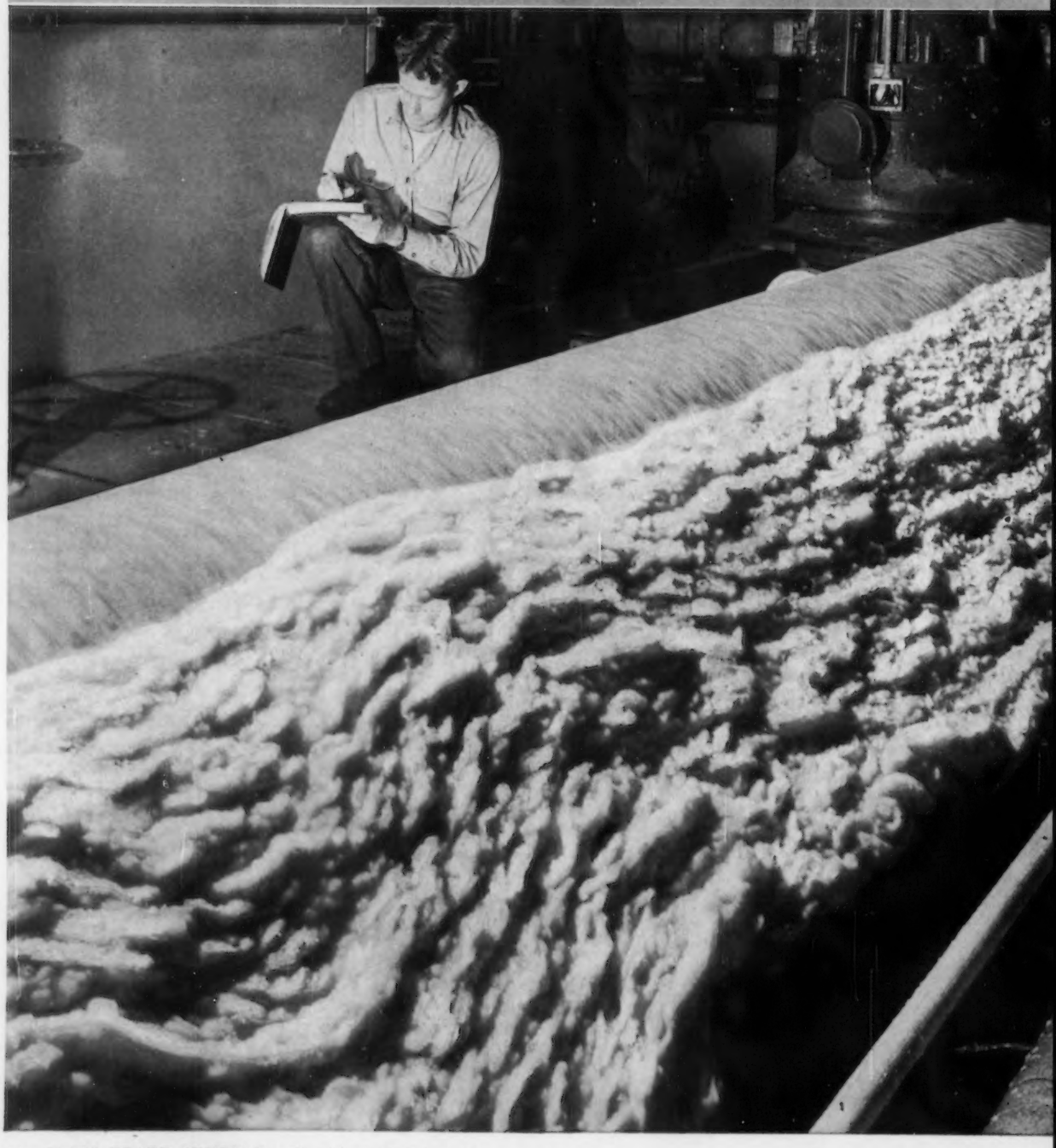

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Pulp, Paper and Board —1958 Outlook

W. LeRoy Neubrech

Assistant Director, Pulp, Paper and Paperboard
Forest Products Division, U. S. Dept. of Commerce

United States production of paper and board in 1958 is expected to establish an all-time record high of about 31.5 to 32 million tons, or from 3 to 5 per cent greater than in 1957. Wood pulp consumption will parallel the trend in paper and board output and domestic pulp production is expected to maintain its relative position in the market.

In 1957 United States production of paper and board totaled about 30.5 million tons according to preliminary estimates, or about 2.5 per cent below 1956. In 1956 and early 1957 there was an inventory accumulation above normal stock ratios by many paper and board converters, distributors and consumers which was largely liquidated in 1957. Production in 1958 is expected to follow quite closely the level of actual consumption.

Greatly accelerated emphasis by the pulp, paper and board industry on market research including new product development, new applications and uses and technical advances in quality and diversified properties is an important factor in the anticipated upward growth projected for 1958.

Paper Industry in 1957

The pulp, paper board and converted products industries (designated as Major Group 26 in Standard Industrial Classification) encompasses the production of pulp from wood and other fibrous materials, the manufacture of numerous grades of paper, paperboard, building paper and building boards, as well as the converting of these materials into various end products. In 1957 it is estimated that the aggregate value of sales of these industries totaled about 11.5 billion dollars; in 1958 this should increase to over 12.0 billion dollars.

This analysis is concerned particularly with 26 pulp mills, paper mills, paperboard mills, and building paper and building board mills. There is a close relationship between consumption of pulp, paper and board and key economic indicators. These relationships are analyzed in detail in the studies

W. LeRoy Neubrech

prepared in 1957 by the Pulp, Paper and Paperboard Subdivision, Forest Products Division, Business and Defense Services Administration—"Pulp, Paper and Board Supply-Demand" and "Technical Guide to Pulp, Paper and Board Supply-Demand."

Production of paper and board for the year 1957 will probably total around 30.5 million tons or about 2.5 per cent below 1956 output. The moderate 1957 decline may be attributed generally to a reduction in inventories accumulated in 1956 in converting and distribution channels. Actual ultimate consumption of most grades of paper and board in 1957 will probably be about equal to, or slightly in excess of, that in 1956 when production apparently somewhat exceeded final demand and pipeline inventories accumulated.

General Business Picture for 1957

The Gross National Product—the market value of the output of goods and services produced by the national economy—measured in terms of constant 1956 dollars is expected in 1957 to be about the same as, or slightly above, the record of 1956. The Federal Reserve Board index of industrial production for 1957 will probably be very close to that for 1956. These economic indicators, which in the past have been barometers of total paper and board consumption, would indicate that ultimate consumption of total paper and board in both 1956 and 1957 was probably about the same—in the neighborhood of 35.8 million tons. Consumption includes imports, particularly of newsprint.

Outlook for 1958

Should the nondurable sector of the economy increase its activity in 1958, the paper and paperboard industry should be favorably affected, since broad-scale use of paper and paperboard in packaging and shipping of nondurables is a major factor in the demand for millions of tons of production.

Greater emphasis is being placed by more and more pulp, paper, and paperboard companies on market research, new product development, new applications, and increased consumption in established uses. For many companies, this is a comparatively new activity that is receiving priority attention from top management and one which should increase and broaden markets and consequent production volume in 1958.

Three to Five Per Cent Increase

On the assumption that the total economy as measured by the Gross National Product in constant dollars will be maintained or advance slightly in 1958, the demand for paper and board should follow in similar proportion. To this should be added an increment for new uses and applications of paper and board, a field that was almost completely neglected in the previous several years of strong demand. Since production of paper and board in 1957 was somewhat below actual consumption because of inventory liquidation of excess stocks, the estimated demand for United States production in 1958 of about 31.5 to 32 million should exceed 1957 by 3 to 5 per cent. This achievement would establish an all-time high record for the United States pulp, paper and board industry.

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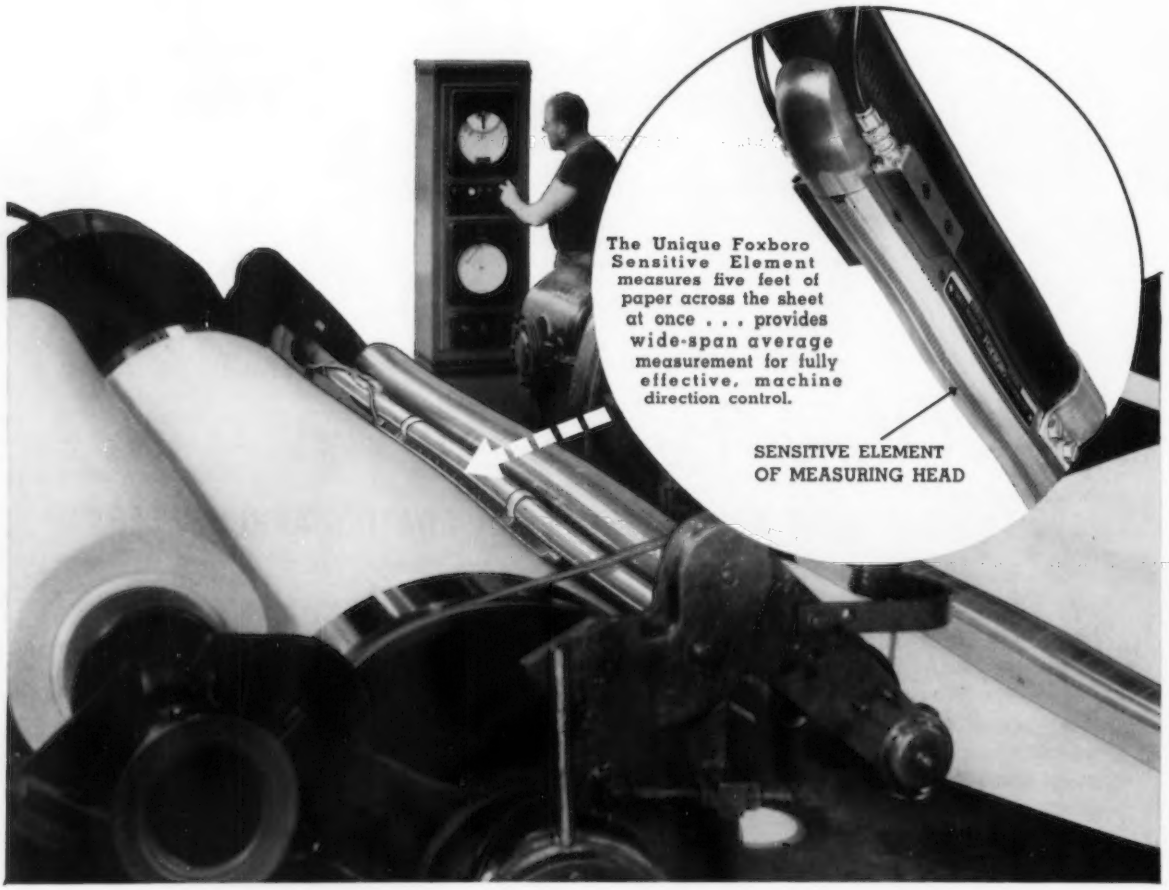
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Pulp and Paper Manufacture

In the Soviet Union 1917-1957

Dr. J. L. Keays

Supt. Research & Development
Powell River Company, Limited
Powell River, British Columbia, Canada

Very little is known about the Russian industry. This is probably the most detailed report on the subject ever published outside the U.S.S.R.

- **Russia has one-third of the world's forests**
- **Russia could raise production to any level**
- **A 50 per cent increase is planned between 1955-60**
- **Paper will still be in short suppply**
- **Increased use is being made of other raw materials**
- **Pulp and paper research is of a high quality**

The Union of Soviet Socialist Republics is incomparably wealthy in forest resources, having over one-third of the world's forest lands; most of the forest growth is coniferous, and the total timber reserves are estimated to be 2,100 billion cubic feet, or four times that of Canada, five times that of the United States, and seventeen times that of Norway, Sweden, and Finland combined. To the present, not too much has been known in the Western world concerning the pulp and paper industry of the Soviet Union, its magnitude and general technological level, or its plans for the future.

Mills in 1917

The revolutionary government of 1917 inherited from its Czarist predecessors some 38 small paper mills, six board mills, and seven pulp mills, with a peak production capacity, reached in 1913, of 197,000 tons* per year of paper, 21,000 tons of board, and 41,000 tons of pulp. From 1917 on, all Russian industry, including the pulp and paper industry, was severely disrupted, as war and revolution and counter-revolution swept back and forth across the land. It is estimated that the total Russian paper production in 1920 was no more than 35,000 tons, and it was not until 1924-25 that production levels were raised to those of 1913.

As a part of the first two five-year plans, from 1928 to 1938, considerable emphasis was placed upon expansion of the pulp and paper industry, and a number of new mills were built, including:

Balakhna, near Gorki (sulphite pulp, newsprint, and paperboard)

Kondopozhsk, north of Leningrad (sulphite, newsprint, and composition board)

Solumbal'sk, in the Arkhangel'sk region (kraft pulp and paper)

Arkhangel'sk (sulphite pulp for viscose and for paper, and sulphite alcohol)

Kamsk, near Perm (or Molotov) in the Urals (bleached sulphite, groundwood, writing papers, fiberboard); one of the most important pulp and paper complexes in the Soviet Union.

Vishersk, in the Urals (pulp, paper, and fiberboard)

Segezhsk, in the Karelia-Finnish SSR (kraft pulp, wrapper and bag paper)

Syas'sk, in the Leningrad area (sulphite pulp and paper)

Post War Expansion

Much of the industry of the Soviet Union suffered a severe setback in the Second World War, when a large part of the western provinces, where many of the pulp and paper mills were located, became occupied territory. The total damage during the war years to all branches of industry was extreme, and a number of paper mills, with a capacity of 300,000 tons of paper per year, were destroyed. A second period

* Note: all production figures are given as metric tons.

Russia has one-third of the world's forest lands, giving her reserves four times those of Canada and five times those of the United States.

of expansion followed the end of the Second World War, and new mills were constructed, including:

- Solikamsk, in the Urals (sulphite and newsprint, four machines at 1,000 feet per minute on newsprint)
- Kamenogorsk, in the Leningrad area (offset and fine papers)
- Sverdlovsk, in the Urals
- Zhidachevsk, near Smolensk (paper and paperboard, groundwood and chemigroundwood)

As a result of the production from these new mills, from mills taken over in various territories, and as a result of a modernization program carried out in many of the older mills, Russian paper production has increased over the years as shown in the following table:

Year	Paper Production in Thousands of Tons
1913	197
1920	30
1924	200
1929	385
1937	831
1940	812
1945	321
1946	556
1947	696
1948	838
1949	995
1950	1193
1951	1337
1952	1540
1953	1710
1955	1862
1960	2722 planned

Current Expansion

The proposed increase in production for the years 1955-1960 is to be achieved for the most part by an expansion of existing facilities, and only in relatively small part by the construction of new mills. At the end of 1960, major expansion should be completed in the pulp and paper mills at Arkhangel'sk, Kotlas (near Archangel'sk) and Krasnoyarsk (in Siberia, midway between Irkutsk and Omsk). New viscose pulp mills are planned for Ulan-Ude (east of Lake Baikal), Salzan (on the southern shores of Lake Baikal), and Komsomol'sk-na-Amur (600 miles north of Vladivostok). These mills are expected to provide an additional 380,000 tons per year of viscose pulp. New boxboard pulp mills are planned for Astrakhan (on the Caspian Sea, near the mouth of the Volga), for the Kazakh SSR, and for Bratsk (east of Krasnoyarsk). A pulp and paper mill will be constructed at Syktyvkar (capital of the Komi ASSR), together with board mills for the utilization of reeds or rushes at Kherson (on the Black Sea at the mouth of the Dnieper) and at Ismail (near the Black Sea, in the marshlands of the Prut). This latter development is considered to be a particularly important one in the economy of the Soviet Union, which has something over 12 million acres of marshlands growing little but reeds and rushes.

Modernization is planned for 160 fourdrinier machines and 23 cylinder machines. These plans involve the installation of 43 headboxes (including 17 pressure boxes), 174 suction couch rolls, 10 suction pickups, 128 suction presses, 440 new drier cylinders, and 50 new paper machine drives.

Modernization of some 30 pulp mills will involve the installation of circulating systems on the digesters, steam chip packers, heat exchangers, modern round screens, vacuum filters and deckers, modern recovery units in kraft mills, and a more general use of disc refiners. New pulp mills under construction or existing mills being expanded will be equipped with stainless-clad digesters, 110 to 320 cubic meters capacity and operating at 150 to 180 p.s.i.; cooking will be automatically controlled and cooking times are being reduced from the 15-20 hour range down to seven-nine hours.

A more detailed picture of the sixth five-year plan for the Russian pulp and paper industry for 1960 compared with 1956 is shown in the following table:

Product	Production in Thousands of Tons 1956	1960
PAPER		
Total	1850	2722
Newsprint	330	500
Typographic	222	357
Writing	173	269
Bag	143	300
Cable	11.7	27
Condenser tissue	2.48	6.2
Paraffin base	8.1	27.6
Cigarette	5	8.3
PAPERBOARD		
Total	533	1226
Boxboard	51	400
CHEMICAL PULP		
Total	1750	2900
Viscose pulp	90	270
GROUNDWOOD	718	1177

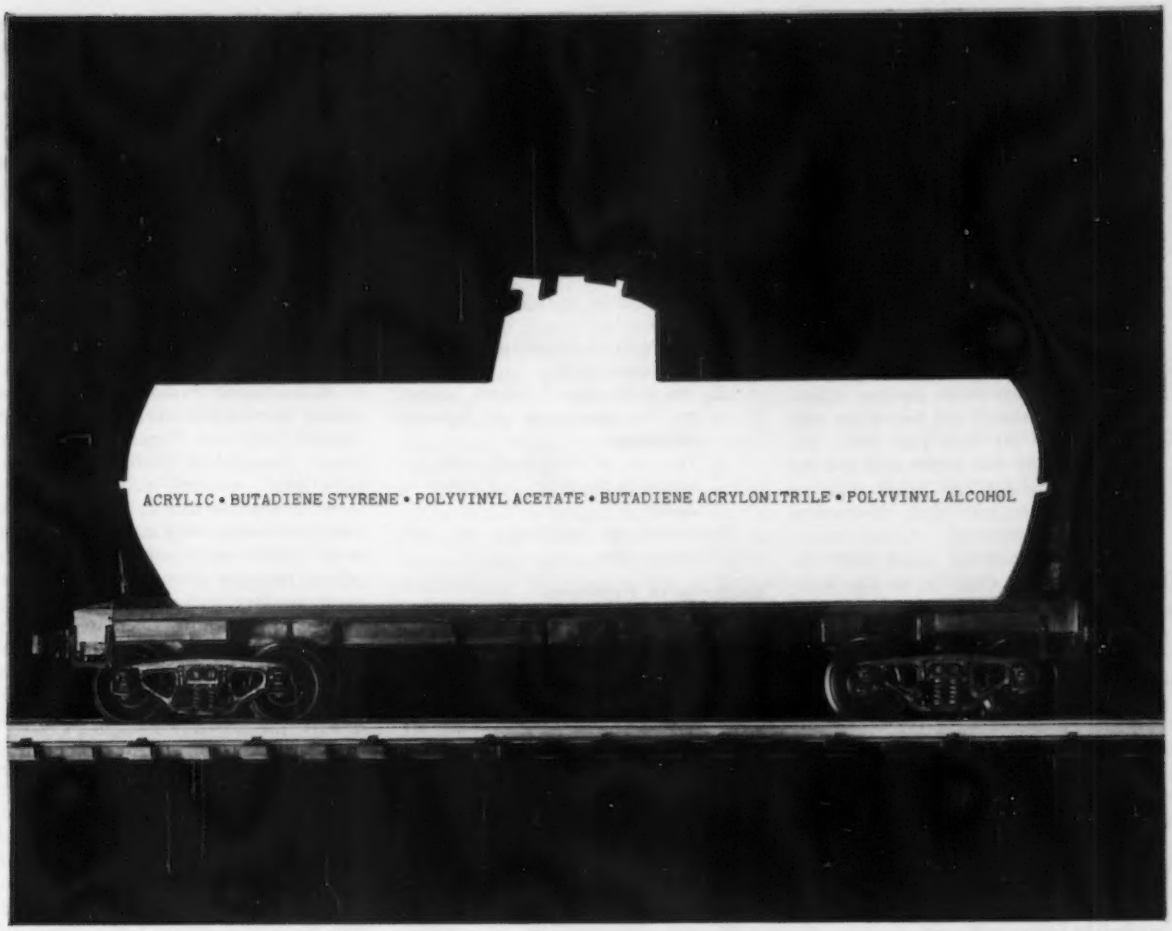
The increase in paper production will permit an increase in newspaper circulation from 10.4 billion copies in 1955 to 15 billion copies in 1960. The annual production of books and journals will be increased from 11.5 billion to 20 billion, and the number of school exercise books to a total of 3.4 billion. It is considered by those responsible for planning the production levels for the pulp and paper industry, that in spite of the increased production expected by 1960, the economy of the Soviet Union at that time will be seriously deficient in almost all categories of paper, and paperboard pulp, including newsprint, writing papers generally, paper bags (which will be increased from 400 million to 600 million units), all types of papers utilized by the food, confectionery, and retail industries, boxboard, wall papers, and fine papers. The only two types of paper which are expected to be in adequate supply by 1960 are textbook and school exercise book papers.

In addition to the increased production resulting from the construction of a few new mills and the expansion or modernization of many of the existing mills, considerable planning attention is to be paid to improving the quality of all pulp and paper products, increasing production efficiency, and reducing production costs. It is proposed to reduce the average basis weight of writing paper, for example, by 10 to 15 per cent, in order to provide a corresponding increase in area of usable paper. It is also planned to reduce the per cent chemical pulp in newsprint furnish to 16-17 per cent compared with the 20-25 per cent presently used.

Raw Materials

Two broader aspects of the sixth five-year plan, insofar as it relates to the pulp and paper industry, are an increase in the degree of regional self-sufficiency and a broadening of the raw material base of the industry; the latter is to be achieved by increased use of deciduous wood species, sawmill wastes, paper wastes, and supplementary fiber raw materials such as reeds and straws. Increased regional self-sufficiency and a reduction in transportation costs will be

Russia is greatly increasing its use of sawmill and veneer plant wastes. More high yield, semichemical and chemigroundwood plants are being built.



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achieved by the construction of new mills in those areas where the present degree of self-sufficiency is low. By 1960, it is planned that 78,000,000 cubic feet (piled) of wastes from sawmills, plywood plants, etc., will be used in pulp production. The manufacture of plywood will be increased from 180,000,000 square feet to 1,000,000,000 square feet in 1960, and waste from this production will be used in the manufacture of pulp or of composition board, production of which is expected to reach 600,000 cubic meters by 1960.

As a part of the program to conserve resources, the production of high yield and semichemical pulps for the manufacture of boxboard and bag paper will be increased. At least two mills, the Svetogorsk pulp and paper mill and the Zhidachevsk paper and board mill are expected to increase their production of chemigroundwood. Continuous semichemical pulping units will be constructed and installed in the Segezhsk and Mariisk kraft pulp and paper mills, with planned productions of 250 and 100 tons per day. In the new Ulan-Ude mill, viscose pulp will be manufactured from bleached kraft from pre-hydrolyzed wood; the Priozersk and Svetogorsk viscose mills will be converted to this type of viscose pulp manufacture.

The Priozersk and Kondopozhsk mills are using a recently developed method for the production of a composition board containing 50 to 100 per cent bark, and this development will be extended to other mills with facilities for making composition board.

Technical Publications

One obvious guide to the technological level of the pulp and paper industry in the Soviet Union is to be found in the technical publications of the industry. *Bumazhnaya Promyshlennost*, transliterated *Paper Industry*, is a monthly trade journal founded in August 1922, and devoted exclusively to the Soviet pulp and paper industry. It has a standard format, and is representative of a number of present-day Russian technical and trade journals, which have more in common with government technical bulletins than with trade journals as they are known in Canada and the United States. Each issue of *Bumazhnaya Promyshlennost* has 32 pages of text, and is divided into a number of subdivisions — Scientific and Technical, Exchange of Information, Foreign Events, Economics and Planning, and Book Reviews.

The August issue for 1957 may be considered more or less typical, and is made up as follows:

Scientific and Technical

Page

1: Index
2: Problems in obtaining high quality viscose pulp
5: The influence of cation valence on the properties of lignosulphonates
6: The use of carbon-graphite materials in the pulp and paper industry
8: Automatic regulation of pulp consistency

Exchange of Experience

11: Practical results from the use of deep side relief (involving partial vapor-phase sulphite pulping)
12: More efficient pulp washing in diffusers
15: Washing kraft pulps in diffusers
16: Factors influencing paper quality (deals particularly with the effect of various paper machine and furnish variables on paper smoothness)
17: Continuous beating in the production of low-caliper papers
20: The mechanization of charging digesters with rags
23: The use of flax and hemp wastes for the production of boxboard

From Abroad

24: The production of composition board (review of a recent Geneva conference on this subject)
27: The hygroscopicity of paper and its measurement (Translation of a paper by G. Schmidt, from *Wochenblatt für Papier)*
28: Paper from synthetic fibers (abstract of an article from *Paper Trade Journal*, 1956, No. 10)

Information

30: All-Union Association Conference on Problems Related to the Production of Condenser Paper (report on a conference held June 4-7 in the Malinsk paper mill)

Book Reviews

31: Review of a book by A. V. Chirkov: "Planning the Production of Pulp and Paper Mills," by a panel of five experts in the field.

Research and Development

The bulk of all research and development work carried out in the USSR and pertaining to any branch of the manufacture of pulp and paper is published in *Bumazhnaya Promyshlennost*. The greater part of this work is done in the Central Pulp and Paper Research Institute, founded in 1930, which maintains large and well equipped laboratories in Moscow and in Leningrad, and which is staffed with something in the order of 50 senior scientists; it is the official research division of the government ministry responsible for the pulp and paper industry. All phases of pulp and paper manufacture or subsequent processing — process efficiency or the development of new processes, product quality or the development of new products, reduction of wastes or in production costs, etc.—come within the jurisdiction of the Institute, whose personnel are responsible for the development, production, installation and repair of testing and control instruments used in the pulp and paper mills. The Institute publishes special bulletins on the progress of various research problems, and most new developments in Russian pulp or paper mills are worked out in a collaborative effort between Institute scientists and mill staffs. The Kirov Academy of Wood Technology and the Leningrad Molotov Technological Institute, although not equal to the Central Institute either in size or importance to the pulp and paper industry, do considerable research and development work in the pulp and paper field, or in closely allied areas.

In addition, research work on the preparation or properties of wood or cellulose or paper or other derivatives, on materials of construction for paper mill or pulping equipment, on instrumentation or on a wide variety of problems directly or indirectly related to pulp and paper manufacture are carried out at the following state operated institutions:

The Ukrainian Paper Research Institute
Academy of Sciences, Latvian SSR, Forest Branch
Academy of Sciences, SSSR, Institute of Wood Research
Academy of Sciences, SSSR, Karelian Affiliate
Leningrad Kalinen Polytechnic Institute
All-Union Research Institute of Hy-

Expansion, although fairly rapid, does not appear to be sufficient to meet the growing demands of the Soviet economy. It is much less than the rate for electronics, nuclear power, missiles, etc., apparently as a result of a deliberate policy.

drolysis and Sulphite-Alcohol Industry
Research Institute for Paper Machinery
All-Union Institute of Artificial Fiber Research
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Central Research Institute of Veneer and Furniture
Moscow Textile Institute
Research Institute for Polygraphic Machinery
Moscow Mendeleev Institute of Chemical Technology
Academy of Sciences, SSSR, Institute of Organic Chemistry
Academy of Sciences, SSSR, Institute of General and Inorganic Chemistry
Central Research Institute of Leather Substitutes
Concrete Research Institute
Steel-Concrete Academy of Construction and Architecture
State Light-Metals Research Institute
Moscow Institute of Chemical Machinery

Current plans call for a 50 per cent increase in paper production in the U.S.S.R. between 1955 and 1960.

Technical Personnel

Both the research centers and the pulp and paper mills appear to have a nucleus of highly competent and highly trained personnel, and the general level of technical competence appears to be rising rapidly. Any major expansion of the pulp and paper industry would necessitate a major increase in technically trained personnel; it is doubtful if these technically trained men are presently available, but there are available for their training the necessary teaching facilities and staff, made up of a group of competent men who have served the Russian pulp and paper industry for many years, both in the mills and in the various research and technical institutions. Among the most prolific contributors to *Bumazhnaya Promyshlennost* during the past few years has been M. M. Kopantsev, presently Director of the Second Kalingrad Pulp and Paper Combine, who has published articles on barkers, pyrites burning, new methods of hot barking, acid plant operation, the use of liquid SO_2 in acid make-up, and sulphite pulping in the vapor phase; P. A. Tumbin, of the Kamsk pulp and paper mill, who has contributed technical papers on a wide variety of subjects, including beating, rosin preparation, determination of the end of a sulphite cook, paraffin-clay emulsions, sizing of paper and fiberboard, paper machine wires, refiners, pyrites burning, bleaching groundwood with hydrogen peroxide, acid plant operation, etc., and L. E. Volkov, of the Research Institute for Paper Machinery, in the field of engineering theory and applied technology.

Among those who have been in the forefront of pulp and paper technological developments have been S. G. Shukhman, an expert in various modern engineering developments; D. M. Flyate, an expert on sizing and the general subject of paper quality; F. P. Komarov, who has published a number of technical papers on pulp reactivity, fiber morphology, pulp bleaching, and viscose pulp quality; G. S. Kosaya, working in the field of kraft pulping and viscose pulp quality; and M. G. Iliashberg, whose particular province is sulphite pulping.

Two of the senior scientists working in the pulp and paper field are Yu. N. Nepenin and N. N. Nepenin, both on the staff of the Kirov Academy of Wood Technology; the former has written a number of scientific papers on kraft and sulphite pulping, and the latter, 74 years of age and director of the pulp and paper division of the academy, has published over 80 scientific papers in the pulp and paper field.

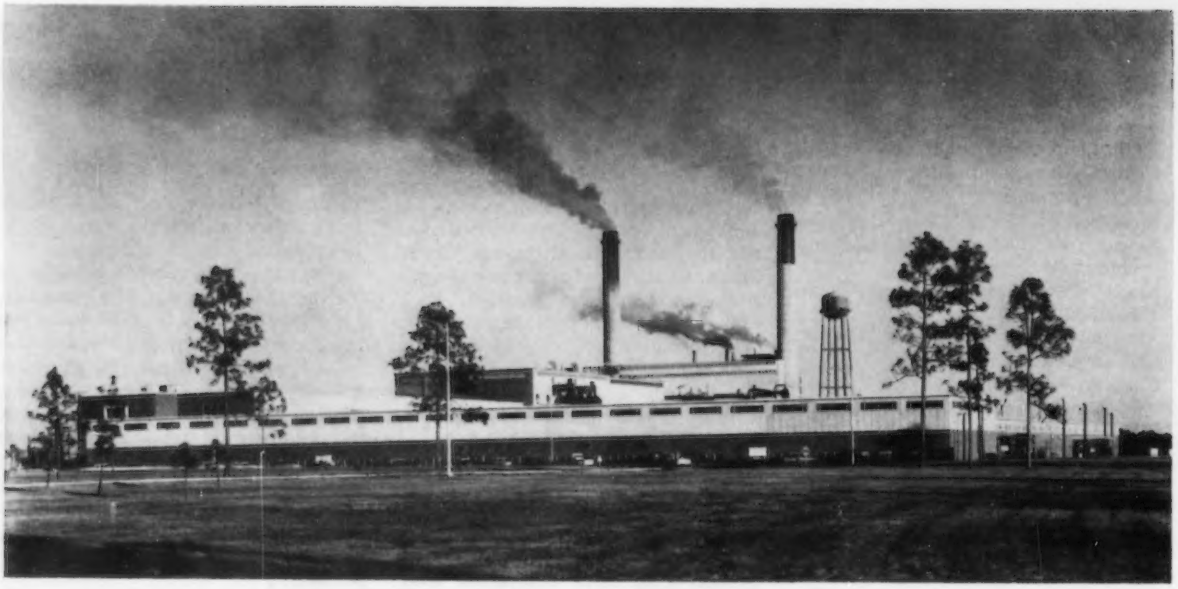
One research scientist deserving of special mention is N. A. Rozenberger of the Central Pulp and Paper Research Institute who has been working in the pulping field since the early 1930's; in the past several years he has published a number of papers on the theory of sulphite pulping, high-yield, the distinguishing characteristics of pulping with various bases, two-stage pulping of *pinus silvestris*, and recently, a paper on the properties of high-yield pulps in the 65-75 per cent yield range prepared by the kraft, bisulphite, monosulphite, and calcium base acid sulphite cooking methods. The quality of Rozenberger's work has been consistently high, and his researches on pulping are probably as advanced as those of any investigator in this field.

Special mention should also be made of L. P. Zherebov, who, at 94 years of age, is still active in the pulp and paper field—a member of the editorial staff of *Bumazhnaya Promyshlennost*, and a senior advisor to the government on pulp and paper planning. Professor Zherebov graduated from the University of Moscow in 1886, among his first publications were one in 1893 on the chemical side of the sulphite pulping process, and another in 1894 on the theory and practice of paper sizing. He started lecturing in Moscow on pulp and paper technology in 1899, and since 1920 has published over 50 papers on a wide variety of subjects, including sulphite and sulphate pulping, sizing, the chemistry of wood, and bleaching. In 1955 he was still actively directing research work in his own laboratory, and in that year published a paper on the theory of sulphite pulping.

Summary

Based on an analysis of the pulp and paper industry in the Soviet Union, a few broad generalizations can be drawn, subject to the usual reservations where there is a high degree of extrapolation between the known and the unknown. The Soviet Union is five to ten years behind the United States and Canada in the technological level of pulp and paper production. In the quantity and quality of its research, and in the quantity and quality of its research facilities and personnel, the Soviet Union is several years behind the United States and Canada, and is catching up rapidly. The pulp and paper industry of the Soviet Union is expanding, but the proposed degree of expansion up to 1960, the last year for which reasonably firm figures are available, and the probable extent of expansion for perhaps five years beyond 1960, will not meet the growing needs of the economy of the USSR. Compared with a number of other fields—electronics, aviation, nuclear power, missiles, etc., the rate of expansion of the pulp and paper industry is relatively modest, and would appear to be so as the result of deliberate policy. The Soviet Union has the forest resources, and either has or should be able to develop rapidly the technical skills, the plant, and the personnel necessary to achieve any desired level of pulp and paper production.

There is a shortage of technically trained personnel in the pulp and paper industry to handle any major expansion, but teaching facilities and staff are available for training.



Rayonier's Newest Mill Formally Opened In Jesup, Ga.

"Mirror-images" the 1954 Mill at Jesup produces pulps for chemical uses and paper pulps.

Rayonier formally opened its second 100,000-ton pulp mill at Jesup, Ga. on January 10, the eighth in this U. S. and Canadian pulp producer's group. This new unit which began operating late in October, together with current modernization at other mills, boosts Rayonier's annual capacity to 915,000 tons.

Representing an investment of some $25,000,000, the new plant, known as Unit B, is built in "mirror image" of the Rayonier mill Unit A, placed in production there in mid-1954.

Executive vice president Russell F. Erickson explained that the basic production units of the second unit duplicate those of the first . . . "the mill accurately mirrors in design our first Jesup plant." The plan for the new additional mill was "frozen" three years ago after the first Jesup unit proved the success of its new design and process, he added.

The new mill, located right alongside the earlier mill, can operate as a single, independent unit; or it can work in conjunction with the other plant, simultaneously producing the same product. Or, one unit can produce wood pulps for the paper industry, while the other manufactures a special new pulp for rayon high-tenacity tire cord.

Engineering Similar

The newer mill, like the first one, has unusual flexibility and built-in operational efficiencies, the Rayonier executive declared. It also utilizes "the significantly new process developed by Rayonier research and engineering."

According to B. W. Haskell, Rayonier engineer who supervised all phases of building the new plant, the second mill is physically inter-connected with the original mill in some departments. Steam lines can be tied across, for example, as can the water systems. Some chemical facilities are also tied together. A single electrical power plant is used for both mills.

The original finishing and warehousing building has been extended, rather than duplicating this already vast roofed area.

Contractors for Unit B at Jesup

Detail engineering, draughting and construction supervision by Ebasco Services, Inc., N. Y.

Concrete, masonry, miscellaneous offices by McCoy-Helgerson Co., Greenville, S. C.

Piping contractors: Rowland Tompkins & Sons, N. Y.

Electrical contractors: Cleveland Electric of Jacksonville, Fla.

Machinery erectors: Dearborn Machinery Movers, New Orleans Office.

Construction service management: Ebasco Services, Inc., New York.

Water Supply and Waste Disposal

The lagooning system for handling disposal of waste materials has been enlarged. Mr. Erickson observed that special attention was given to this aspect of the operation, involving for several years the nation's top scientific ability in the fields of sanitation and stream biology.

The resulting new sewage system is capable of handling 50,000,000 gallons of water daily through a split system. One disposal section handles black liquor wastes and includes a retention basin for settling and storage for up

to 90 days. The other section provides settling capacity for the 49,000,000 gallons of wash water discharged daily.

Mr. Erickson noted that the enlarged waste disposal system was actually in excess of the two mills' operational requirements. However, Rayonier beneves this additional capacity will permanently insure that the Altamaha River will continue to provide good fishing.

The new water supply system provides 24,000,000 gallons of water per day, bringing the total daily supply to 48,000,000 gallons. The new water treatment facilities are a duplicate of the first unit at Jesup and include softening capacity for 9,000,000 gallons daily. Additional water was obtained from four new wells drilled on the 538-acre site.

The two mills, which form the company's Jesup Division, have a combined annual production capacity in excess of 200,000 tons.

Rayonier officials, questioned about the need of additional production capacity at this time, said there is no basic change in the world consumption of cellulose; that all economic studies point to a continuing rise in the world of these products. "Rayonier's long-term plans are drawn on this basis."

Since the completion of the first Jesup mill in 1954, the company has invested $89,000,000 in plants, research and woodlands.

Optimistic about the immediate outlook for the new mill, Rayonier says it will bolster its sales position by making immediately available new tonnage in the highest grades of chemical cellulose and wood pulps.

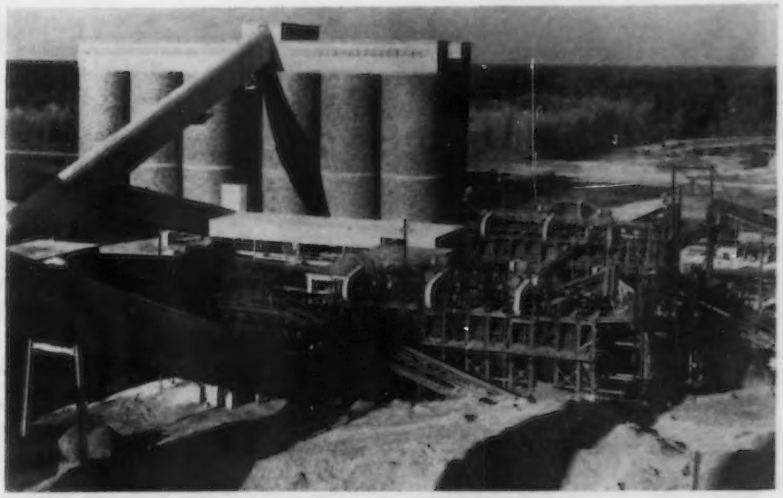
With the completion of the new mill, the Jesup Division's work force now totals 725 with an annual payroll estimated at $4,000,000.

Wood Sources

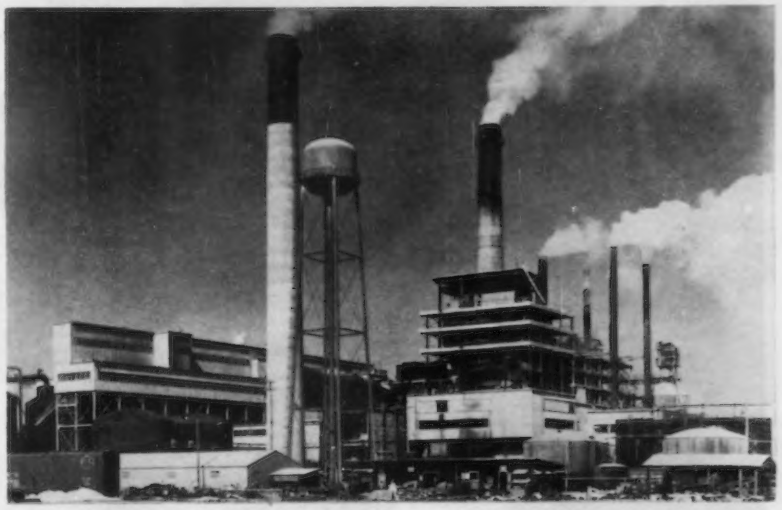
To support the two mills with its basic raw material, nearly 500,000 cords of southern pine and hardwood will be required annually. Some of this wood is supplied from Rayonier's 700,000 acres of pine plantations in southeast Georgia and northeast Florida. However, a sizeable portion is purchased locally from private tree farmers. Last year, Rayonier's purchases of wood for just the one Jesup unit amounted to approximately $6,400,000, most of the wood coming from within a 50 miles radius of the plant.

Details of Plant

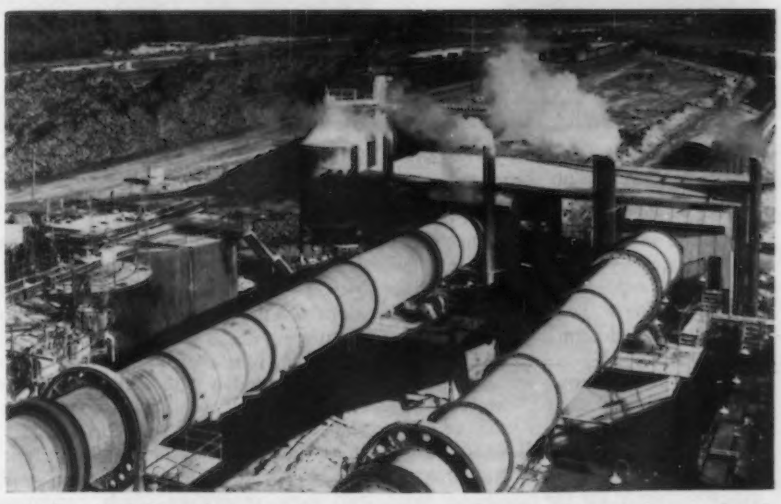
- Incoming wood arrives 'round-the-clock by both truck and rail. Pulpwood storage is designed for a maximum inventory of 20,000 cords.
- Six new chip silos were built ad-



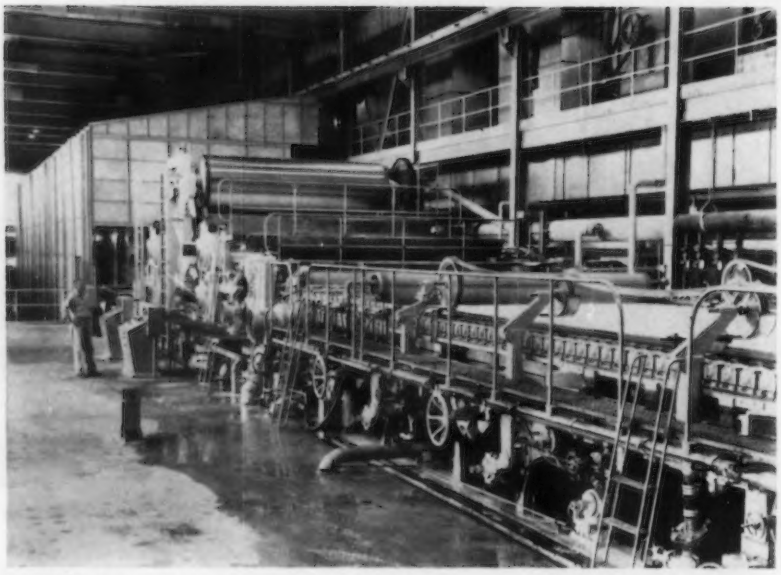
CHIP SILOS AND BARKING DRUMS. Clearly visible is the "mirror image" feature of these two installations.



STACKS, DIGESTER HOUSE (left) AND RECOVERY (right) are also in "mirror image." New mill lies in foreground.



KILNS, old (left) and new (right). In background is a section of the woodyard.



WET END of Rice Barton pulp drying machine which is identical with original machine.

SECTION OF ENLARGED FINISHING ROOM. Here pulp sheets ride conveyors during final processing stages.

jacent and identical to the earlier ones. A new conveyor feed was erected which can supply either the existing or new digesters. To the original eight digesters, an additional eight identical units were added.

• The pulp washing system is practically in "mirror image." Most equipment is very similar to the original equipment installed in 1953-54.

• The bleach plant is the same as that constructed for the first Jesup unit. However, additional pulp storage tanks have been built to provide better blending and more storage capacity.

• The new fourdrinier type pulp machine is a duplicate of the earlier equipment.

• The finishing building has been greatly extended with additional equipment identical to that originally installed.

• The power plant has been redesigned and power out-put boosted with two new generators, each producing 7500 kva. These are turbine driven by steam generated by burning bark and waste liquor, and on occasion heavy fuel oil. All power for the two mills is self-produced. However, there is a tie-line to the Georgia Power System to be used only in emergencies.

• A new B & W power boiler, having a capacity of 200,000 pounds of steam per hour, was installed which operates on either oil or bark. And an additional recovery boiler, nominally rated at 450 tons of kraft pulp was also installed.

• The causticizing areas duplicates that of Unit "A," the original mill.

• The stack for the new mill duplicates its twin in all respects and like the original one is 250 feet tall. This is 50 feet higher than either were required to be, according to Mr. Erickson. But Rayonier felt the additional height was extra insurance against an odor nuisance.

The start-up of the new unit was exceptionally good, achieving the production of first-grade pulp immediately, according to Fred B. Loherty, resident manager of the Jesup Division.

Major Suppliers for 2nd Mill at Jesup

Silos, tile tanks by Stebbins Engineering & Manufacturing Co.

Twin stack, 250 ft. high by M. W. Kellogg Co.

Eight digesters, stainless steel lined, fabricated by A. O. Smith Corp.

Power Plant: Two new Westinghouse generators; new power boiler, using oil or bark as fuel, by Babcock & Wilcox.

Recovery boiler, by Combustion Engineering.

Precipitator by Research-Cottrell, Inc.

Causticizing area, a duplicate of first Jesup unit: equipment by Dorr-Oliver.

Lime kiln by Allis-Chalmers.

Bleaching equipment by Improved Machinery.

Pulp machine by Rice Barton.

Finishing equipment by Lamb Grays Harbor.

Conveyors by Jeffrey Manufacturing Co.

Pumps by Worthington Corp., Ingersoll-Rand and Bingham Pump.

Motors by Allis-Chalmers and Westinghouse.

Miscellaneous electrical equipment, starters, etc. by Westinghouse.

Switch gear and transformers by Allis-Chalmers.

Structural steel by Ingalls Steel Corp.

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Modern Equipment for Screening Groundwood

All kinds of cleaning equipment used on groundwood are described. Included are data on power consumption, capacity and performance for the various types.

Dr. K. H. Klemm
Manager, München Dachauer Papier Fabriken
Munich, Germany

English text by
G. P. Chinn

The coarse screening of groundwood is considered to be a separate process which is not connected to fine screening and, in fact, according to the arrangement in practical operation, is more related to grinding. The problems related to coarse screening, the coarse screens used and the recovery of the coarse screen rejects, therefore, have been discussed earlier.

In the early days of groundwood production (1), Voelter had used cylinders, comparable in construction to thickeners, to screen groundwood. The pulp was fed from the outside onto a rotating cylinder covered with wire, and the water, with the finer stock particles, passed through to the inside of the cylinder while the coarser stock particles remained on the wire for removal from the system. In 1882 Voith then developed a vibrating flat screen with three wires arranged at different levels. This represented a considerable progress for groundwood production. With these early screens, the complete screening operation was concentrated in one screen. However, the capacity was too low to keep up with the increasing groundwood production. The next development, therefore, was to separate the coarse and fine screening operations, retaining the flat screen for the coarse stage. In 1880, the first centrifugal screens were introduced. These originally were equipped with a vertical shaft as in Figure 1 but later designs showed preference for the horizontal shaft (2). A further development was the Biffar Screening Refiner which incorporated screening and refining in one machine. Since then, there has been a steady improvement in the construction, especially of the centrifugal screens. In the following, the modern screens used as fine screens, and their principles of construction, are discussed with regard to their application in the different screening stages.

Screens for First Screening Stage

In the first screening stage, the demands on the screen are the lowest. Based on the fact that the sliver content of the entering stock is relatively low (2 to 6% depending on the type of groundwood), a sliver yield in the rejects of only 80 to 90 per cent is high enough to give sufficient cleanliness in the accepted stock. Optimum screening efficiency can be expected at 18 to 20 per cent rejects. With a lower amount of rejects, the sliver content in the accepted stock increases whereas if the percentage of rejects increases, the long fiber yield in the accepted stock decreases rapidly while the sliver content in the accepts decreases only slightly. For good screening, constant feed and shower water addition is essential. A constant feed can be maintained by recirculation of accepted stock, the amount of which is controlled by the level in the screen headbox (Figure

FIGURE 1—SCREEN WITH VERTICAL SHAFT (1891)

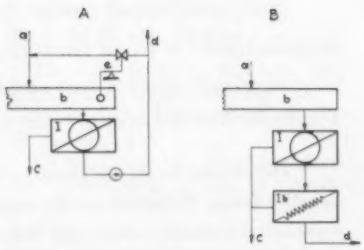


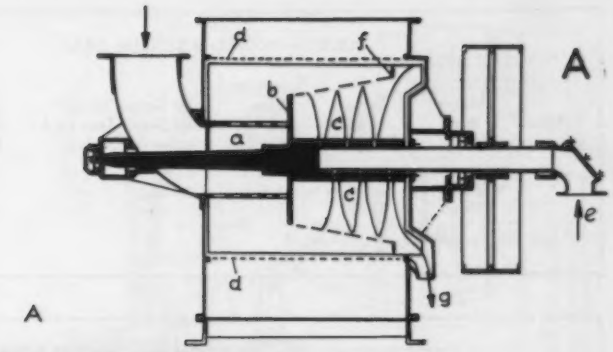
FIGURE 2—POSSIBILITIES FOR IMPROVEMENT IN THE FIRST SCREENING STAGE. A — Accepted stock recirculation; B — Double screening; a—Feed to screen; b—Screen headbox; c—Rejected stock to later screening stages; d—Accepted stock to the thickeners; e—Headbox level controller.

2A). This is especially recommended in mills where the rate of production fluctuates. If it is required to decrease the sliver content in the accepted stock without a considerable increase in the quantity of rejects, the principle of double screening can be used (Figure 2B). The second screen should work on a different principle than the first (e.g. if the first screens have perforated plates, screens with slotted plates, such as the Lindblad or Lindgren, should be used in the following stage). In this way a reduction of the sliver content in the accepted stock of from 40 to 60 per cent can be expected but at the expense of a 10 per cent (relative) decrease in the long fiber yield. Among the modern screens used in the first screening stage are the Cowan, Rottrom, Voith Durchfluss and Waterous Hydrofoil.

The Cowan Screen

The Cowan Screen (Figure 3) (4) is characterized by very high capacity and an extremely small amount of rejects (8-12%). The screening is very sharp with the result that the sliver yield in the rejects, despite relatively small perforations (0.055-0.065 inch for groundwood) is only in the range of 50-60 per cent.

The Cowan is a centrifugal type screen. The slush stock (0.5 to 1.0 per cent consistency) coming from the coarse screens enters through the 1.75 x 18 inch slots of the distribution chamber (a) and passes into the screening cylinder which is divided by the baffle (b) into two chambers. In the first part of the cylinder, comprising about 40 per cent of the screen area, the impetus of the centrifugal forces introduced by the vanes (c) revolving at 240 r.p.m. drives a high percentage of the stock through the perforations of the plate (d). The remaining, and smaller, part of the stock is thickened rapidly and moves towards the baffle at the entrance to the second chamber. This second chamber, having about 60 per cent of the screen area, is designed to act as a secondary screen. The stock is thoroughly washed and diluted with water which enters through openings in the hollow shaft of the screen (e). Further acceptable fibers pass through the screen plates; the remainder of the pulp is carried along to the second baffle (f) finally leaving the screen at (g) in a relatively coarse state. As very different screening conditions exist in the two chambers, smaller perforations are usually used in the second where the screen is working "very sharp" (e. g. for newsprint 0.065 inch at the inlet and 0.055 inch at the outlet side of the screen). The head at the inlet should be between three and six feet and the shower water pressure, 10 p.s.i. Shower water consumption is about 8 to 10 U. S. gal./min./daily ton (o.d.). The Cowan screen is manufactured in three different sizes from which the capacities shown in Table 1 for newsprint grade groundwood can be expected.



A

B

FIGURE 3—THE COWAN SCREEN

A—Working principle. a—Distribution chamber; b—Baffle for the subdivision of the screening chamber; c—Screen vane; d — Screen plate; e — Shower water feed to hollow shaft; f—Ring dam at the rejected stock outlet; g—Rejected stock outlet.

B—Cowan screen installation.

Waterous Mohawk Screen

The Waterous Mohawk Screen has a similar basic design to the Cowan screen. The shaft turns at 240 r.p.m., the plate perforations are in the order of 0.060 inch, the capacity with newsprint groundwood of 0.6 per cent consistency, is about 95 tons (o.d.)/day and the motor size, 75 h.p.

The Rottrom Screen

The Rottrom Screen of the Miag Co. (Figure 4) is one of the few screen types with a vertical shaft. Another distinct difference from the other screen types is the revolving screening cylinder. Drive speed can be constant or variable. In the latter case, the possibility exists of adjusting the speed to suit fluctuations in the feed caused by changes in the rate of production. Because the screening forces are relatively light, large perforations can be used (e. g. with newsprint groundwood, 0.080 to 0.090 inch). In spite of this, the sliver yield in the rejects at good capacity is rela-

TABLE I—COWAN SCREEN CAPACITIES

Type	Motor h.p.	Capacity in tons (o.d.)/24 hrs. at Feed Consistency		
		0.5%	0.75%	1.0%
Cowan "A"	75-100	75	110	145
Cowan "E"	40-60	55	65	80
Cowan "Junior"	20-40	35	45	55

TABLE II—ROTTROM SCREEN DATA

Model	Motor h.p.	Drive r.p.m. (max.)	Screening Drum r.p.m. (max.)	1st Screen Stage* Hole Diam. inches	1st Screen Stage* Tons (o.d.)/day	2nd Screen Stage* Hole Diam inches	2nd Screen Stage* Tons (o.d.)/day
I	15-20	1100	400	0.085	27.5	0.080	16.5
II	25-30	900	300	0.085	44.0	0.080	27.5
III	45-50	800	280	0.085	66.5	0.080	40.0

* Data for newsprint type groundwood.

TABLE III—DATA ON THE VOITH DURCHFLUSS SCREEN

Model	Shaft r.p.m.	Motor h.p.	Capacity tons (o.d.)/24 hours at perforations 0.051"	0.063"
I	450	20-30	22.0	27.5
II	410	30-40	27.5	40.0
III	375	45-60	33.0	50.0

TABLE IV—TYPICAL FEED TO LATER SCREENING STAGES

	At the Inlet to 2nd Stage A*	B**	C***	At the Inlet to Refiner Stage A	B	C
Consistency %	0.60	0.74	0.90	2.6	2.0	1.8
Freeness (Can. Std.)	640	620	400	710	710	560
Sliver Content %	41.0	31.5	9.8	36.8	42.0	10.9
Long Fiber Content %	35.0	28.5	41.5	43.5	38.0	48.6
Short Fiber Content %	16.8	22.5	21.7	15.6	13.0	23.7
Fines Content %	8.0	17.5	27.0	0.6	7.0	16.8
Not suited for passing 0.045" diameter perforations	76.0	60.0		80.3	80.0	
Not suited for passing 0.030" diameter perforations			73.0			83.2

* A—Typical composition with North American newsprint groundwood
** B—Typical composition with European newsprint groundwood
*** C—Fine grades

tively high (about 75-85 per cent). As shown in Figure 4, the stock enters at (a) and passes through the annular space between the revolving cone (b) and the fixed part (c) into the drum (d) which spins in the stock suspension. The accepted stock passes through the perforations and leaves the screen via the adjustable level box (e). The coarse stock which remains on the wire is carried by scrapers to the top of the screen and overflows the upper edge of the cylinder into the circular flume (f) to be carried through the channel (g) to the next screening stage. Because of the large perforations, shower water consumption is kept comparatively low (1.0 to 1.5 U. S. gal./min./daily ton o.d.) and therefore the accepted stock has a relatively high consistency. The amount of rejects is about 15 to 20 per cent of the feed. The method of operation also permits the use of the Rottrom screen in the secondary screening stage. Data for the three types available are shown in Table II.

A particular advantage of this type of screen is the long life of the screen plates and the fact that these can be cleaned during operation. The openings provided for this purpose have removable covers which can be taken off to permit cleaning or the observation of the screening operation at any time without first having to shut down the screen.

Voith Durchfluss Screen

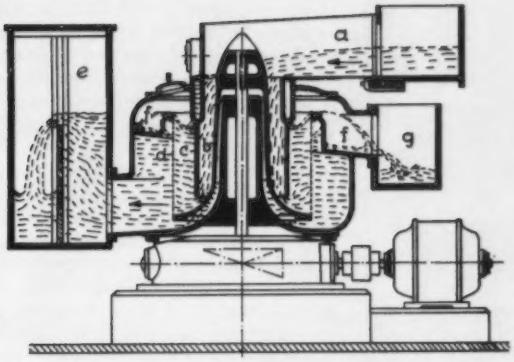
The Voith Durchfluss Screen (Figure 5) has the stock enter through an elbow (a) into the center of the screen from where it is carried by the baffle (b) towards the screening vanes (c). These accelerate the velocity so that the centrifugal forces form a ring of stock which travels along the screening cylinder (d). Aided by the static pressure and the additional centrifugal forces, the major part of the good stock passes the screen holes. The counter-pressure on the outer side of the perforated plates is favorable for the smooth screening operation. The good stock overflows at the top of the screen across the adjustable weir (e). The rejected stock remains inside the cylinder and is guided to the reject outlet (f) by the baffles (g). A butterfly valve in the reject outlet (h) can be used to adjust the amount of rejects according to the feed and, at the same time, provides a possibility for influencing the screening operation. Because the total perforated area is always used for screening, the capacity is relatively high. However, to keep down the sliver content in the accepted stock, comparatively small perforations are required. At a shower water consumption of 6.5 to 9.0 U. S. gal./min./daily ton (o.d.), the percentage of rejects is in the order of 20 to 30 per cent of the feed. The screen perforations used are 0.050 to 0.055 inch for fine grades of paper and 0.060 to 0.070 inch for newsprint. Data for the three models available are shown in Table III.

Waterous Hydrofoil Screen

A relatively recent construction is the Waterous Hydrofoil screen (Figure 6). The new design differs from the conventional screen in that build-up of a fiber layer on the screen plates is prevented by the "hydrofoil" vanes. It is claimed that these give an effect similar to that obtained with the rotating drum vibrating screens and that, therefore, it may also be possible to use slotted screen plates.

As with the Cowan screen, (shown in Figure 6) two screening chambers are provided. The entering stock is fed by the elbow (a) into the first chamber (b) where the screening force is obtained primarily from the hydrostatic pressure of the head of incoming stock. The major part of the good stock passes the perforated plate (c) and the coarser fibers are moved along to the second chamber (d). Here the stock is diluted from the central pressure water chamber (e) and, at the same time, the screen plates are kept clean by the hydrofoil vanes (f), permitting an easier passage for the remaining good fibers. The rejects leave the screen at (g) through the elbow (h) and are carried to further processing. The reject outlet is of a special design and has a device which enables the amount of rejects to be controlled.

According to the data given, this screen works "very sharp" and, therefore, despite the relatively small plate perforations (0.020 inch), the sliver yield in the rejected stock is low. For the standard model a capacity of 90 tons (o.d.) is claimed and a drive of only 20 h.p. is required. The energy consumption, therefore, is very low. How-



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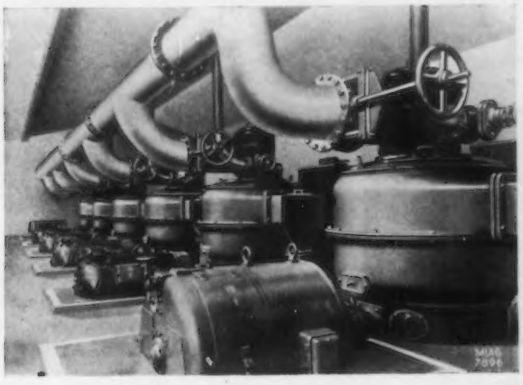
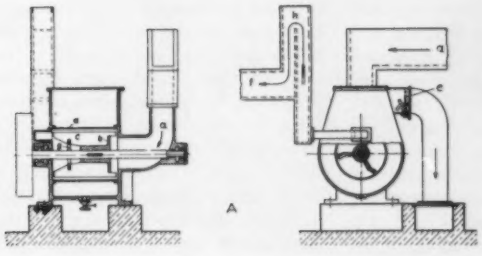


B

FIGURE 4—THE ROTTROM SCREEN

A—Working principle. a—Stock feed; b—Revolving cone; c—Fixed cylindrical part with shower water canal; d—Revolving screen drum; e—Dam box; f—Circular reject flume; g—Reject canal.

B—Rottrom screen installation.



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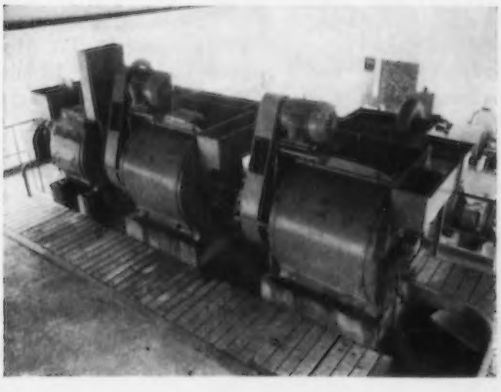

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FIGURE 5—VOITH DURCHFLUSS SCREEN

A—Working principle
a—Stock feed; b—Guide wall; c—Screen vane; d—Fixed screening cylinder; e—Adjustable dam gate on accepted stock outlet; f—Reject outlet; g—Guide wall for the rejected stock; h—Constant level box for rejects.
B — Screen installation with 2 Voith centrifugal screens and 1 Voith Duchfluss screen

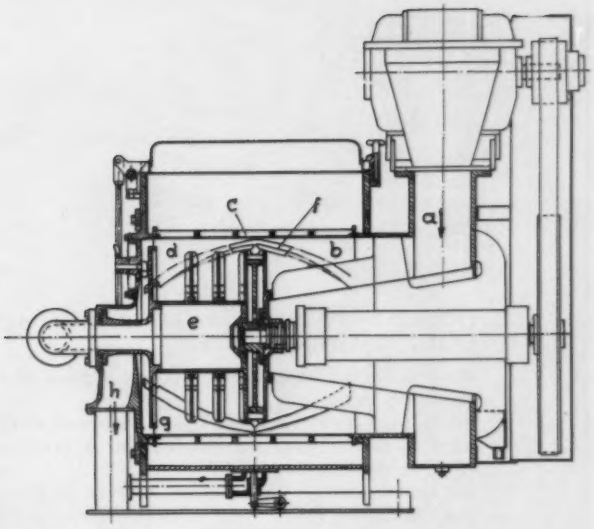

FIGURE 6——WORKING PRINCIPLE OF WATEROUS HYDROFOIL SCREEN

a—Stock feed; b—Guide wall; c—Screen cylinder; d—Second screening chamber; e—Shower water chamber; f—Hydrofoil vane; g—Rejected stock outlet; h—Rejected stock line.

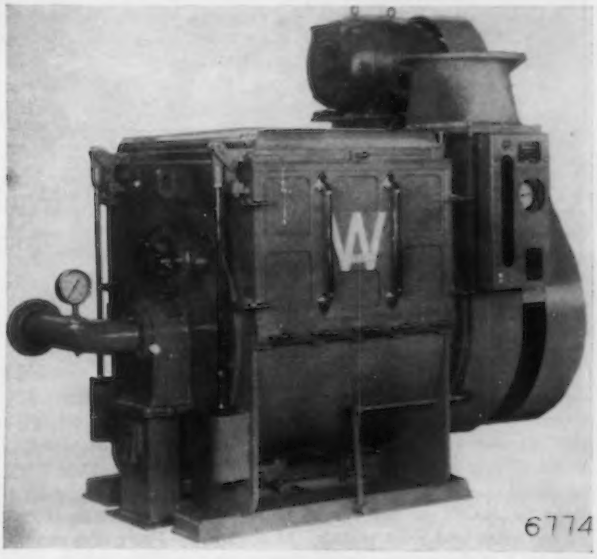

FIGURE 7—WATEROUS HYDROFOIL SCREEN READY FOR USE

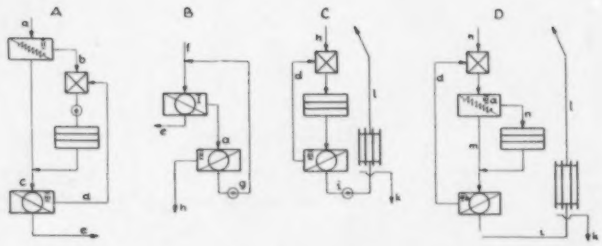

FIGURE 8—POSSIBILITIES FOR IMPROVEMENT ON LATER SCREENING STAGES

A—Insertion of "in-between" screens in place of a second screening stage.
B—Indirect—with recirculation of accepted stock from a later screening stage to the feed of a previous stage.
C—Double screening.
D—Installation of "in-between" screens in the rejected stock screening stage.
a—Rejected stock of the first screening stage. b—Rejected stock of the "in-between" screens. c—Accepted stock from the "in-between" screens. d—Rejected stock from the secondary screen. e—Accepted stock to the thickeners. f—Feed to the first screening stage. g—Accepted stock from the secondary screens. h—Rejected stock from the secondary screens. i—Accepted stock from the "rejects" screen. k—Rejected stock from the "Post" screens—to the sewer. l—Accepted stock from the "Post" screens—feed to the secondary screening stage. m—Accepted stock from the "Pre-" screens. n—Rejected stock from the "Pre-" screens (thickened).

ever, at the inlet, a head of 10 to 12 feet is necessary. The minimum shower water pressure should be 15 p.s.i.

Screens for Later Screening Stages

Screening becomes more and more difficult in the second and the refiner screening stages because the sliver content of the feed is greatly increased. With newsprint screening systems, the sliver content at the inlet of the second stage is usually in the range of 15 to 30 per cent and refiner stage, 35 to 50 percent.* If the screens in the first stage are operated "very sharp" (as is usually the case in North America), a sliver content of 35 to 50 per cent is reached at the inlet to the second stage. From these facts it is obvious that the sliver yield in the rejects of the screens in the later stages must be very high (above 95 per cent) if the sliver content in their accepts is not allowed to become too great. The method employed in actual practice for avoiding this is to use very small perforations (e.g. 0.035 to 0.045 inch for newsprint groundwood). If one considers the typical character of the feed with respect to these perforations, no explanation is necessary to account for the very unfavorable results normally obtained in these stages. Typical data are given in Table IV.

From the examples in Table IV it is evident that the amount of rejects must be at least 60 per cent in the secondary stage and 80 per cent in the refiner stage. This is the explanation for the relatively large amount of recirculating stock.

In the light of these facts, a revision of the principles of the direct screening in stages is required. "Direct screening in stages" describes those systems in which the accepted stock from all stages is used directly for further processing. With "indirect screening in stages," the accepted stock from a later stage is fed to the inlet of an earlier stage. The provision of a second screening stage is recommended only if the percentage of rejects from the primary stage is in the optimum range of 18 to 20 per cent or greater. If it is lower (as is usual with modern screens of high capacity), it is recommended that the second stage be eliminated or replaced only by "in between" screens (A in Figure 8). If the amount of rejects from the first stage is higher than 18 per cent, to decrease the amount of circulating stock, the indirect screening principle is favored. This means that the accepted stock from the second stage is recirculated to the inlet of the first stage (B in Figure 8). This permits a higher splinter content to be tolerated in the accepts from the second stage and, consequently, larger perforations can be used and the amount of rejects decreases. To recover the good long fiber before it is passed to the refiners, the use of slotted screen plates (Lindblad, Lindgren and, eventually, Hydrofoil screens) appears to be favorable although this has not been fully proven to date. When using the recirculation principle, the perforations should be chosen such that the sliver content in the secondary accepts is just equal to, or slightly lower than, that of the stock entering the first stage. If this condition is maintained, the quality of the accepted stock from the first stage remains unchanged. Similar considerations can be used for the refiner screening stage although here it is recommended that vortex type cleaners be provided for double screening the refiner screen accepts. Normally, very fine perforations must be used in the refiner screens to prevent the short, thick slivers from being accepted. If, however, this accepted stock is double-screened in vortex type cleaners, these troublesome particles are effectively eliminated and, consequently, coarser perforations can be used in the centrifugal screens (see Figure 8C/D). "In-between" screens can be used to advantage in the refiner screening stage to:

a—Increase the consistency of the feed to the refiners and to keep it constant.

b—Save at least a part of the good long fibers from being cut in the refiners.

Their installation is only possible, however, if the indirect screening principle is used.

*Brecht and Schroter (6) have emphasized these facts from measurements taken during practical operation. According to their results, the primary rejects of screening systems can be described as follows:

Character of Primary Rejects

Groundwood for	Freeness (Can. Std.)	% Slivers	% Good Stock
Fine Grades	710	14	86
Newsprint	735	45	55

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Fig. 1559—Steel Lubricated Plug Valve for 200 W.O.G. Screwed gland type. 6" and larger valves can be furnished for gear operation.

Fig. 2433SS—Large size Stainless Steel Swing Check Valve for 150 W.P. Bolted Cap.

Fig. 2491—Stainless Steel Gate Valve for 150 W.P. Outside screw rising stem and yoke, solid wedge disc. Can be supplied with interchangeable split wedge disc.

Fig. 2107—Stainless Steel "Y" Valve for 150 W.P. Plug type disc. Face to face and end flange dimensions conform to latest standards.

Fig. 1893—Large O.S. & Y. Gate Valve for Paper Mill Service. 3½% Nickel Iron Body, bonnet, yoke; stainless steel stem, screwed-in seat rings; Ni-Resist wedge.

Fig. 2194—Small Ni-Resist O.S. & Y. Gate Valve for 225 W.O.G. Larger sizes, flanged end, and swing check valves in Ni-Resist also available.

Fig. 1832—Stainless Steel Gate Valve for 200 W.P. Screwed-in bonnet, inside screw rising stem, solid wedge disc.

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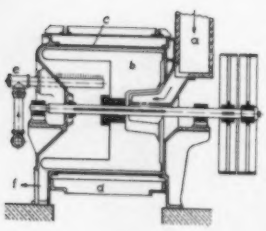

FIGURE 9—WORKING PRINCIPLE OF A CENTRIFUGAL SCREEN

a—Accepted stock; b—Screen vane; c—Screen cylinder; d—Collection chamber for accepted stock; e—Shower water inlet; f—Rejected stock outlet.

For later screening stages, screens with a soft working principle are especially suited as these allow relatively large perforations to be used (e. g. the Rottrom screen as already described). If the claims for the Hydrofoil screen are realized, this screen equipped with slotted plates could be very useful in the refiner stage. In practice, the normal centrifugal screens (such as manufactured by Waterous, Voith and others) are commonly used. The rotating drum vibrating screens (Lindblad and Lindgren) have not been fully proven as yet for this stage with groundwood. In fact, screen types which are really suited for the later stages are still to be developed.

Centrifugal Screens

The construction of the different normal centrifugal screens is very similar so only one type is shown in Figure 9. The entering stock is fed through the elbow (a) and, by the action of the vanes (b), thrown against the perforated plates of the screening cylinder (c). The finer fibers, having passed the screen perforations, are collected below the screening cylinder in the trough (d) and leave over an adjustable dam. By changing the height of the dam, the screening effect can be influenced and adjusted to the rate of feed. The remaining stock is thoroughly washed by shower water which is added at (e) and leaves the screen cylinder through another bottom outlet at (f). For good capacity, a free passage of the accepts and rejects leaving the screen must be provided. For normal newsprint conditions, the capacities shown in Table V are to be expected.

With regard to the use of vibrating screens in the later stages, no definite practical data are available. Slots of 0.012 to 0.014 inch are recommended and an overflow of 20 per cent should be provided. The special advantages claimed for these screens are: the high long fiber yield and the fact that these screens are able to work at consistencies as high as 1.3 to 2.0 per cent at a capacity of 55 tons (o.d.)/day. The energy consumption, as with all vibrating screens, is low; a drive of 15 to 20 h.p. being sufficient. A description of this screen type follows.

"Pre-Screens," "In-between Screens" and "Post Screens"

The modern developments and concepts in the field of groundwood screening resulted in the introduction of improved screen arrangements as have already been shown in Figures 2 to 8. The "Pre-" and "In-Between" screens, in such arrangements, have the specific task of improving the screening conditions for the centrifugal screens by decreasing the sliver content of their feed. For this purpose, the vibrating flat and drum screens are especially suited. The "Post-" screens are provided to re-screen the accepted stock from the centrifugal screens. Their use permits an increase in the size of the plate perforations of the centrifugal screens and provide a safeguard against broken screen plates. For post-screens, a

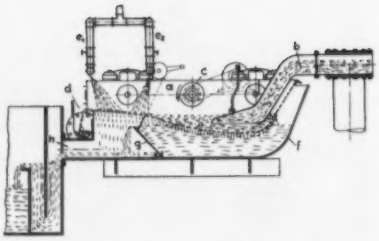

FIGURE 10—PRINCIPLE OF A JONSSON SCREEN

a—Screen trough; b—Stock feed; c—Eccentric shaft; d—Rejected stock flume; e_1, e_2—Shower water nozzles; f—Pit for accepted stock; g—Overflow weir; h—Accepted stock canal.

screening principle other than that used in the centrifugal screens should be employed (e. g. if the first screening is done by perforated plates then slotted plates or vortex screens should be installed for the following stage). The perforated plates are best suited for retaining long fibers and fiber bundles while permitting the short,

TABLE V—CHARACTERISTICS OF CENTRIFUGAL SCREENS

	Voith Centrifugal Screen Screen Stage		Waterous Centrifugal Screen Screen Stage	
	Secondary	Refiner	Secondary	Refiner
Screen plate perforation	0.055"	0.040"	0.065"	0.045"
Motor—h.p.	35	40	60	75
Shower Water—USGPM/daily ton	10	40	18	47.5
Capacity—tons (o.d.) day	22	16.5	33	22
Amount of rejects—%	60	75	80	81
Sliver yield—%	97	98	97.5	99

* These data are related to a system using Cowan screens and, therefore, very sharp screening in the primary stage.

TABLE VI—PERFORMANCE DATA FOR "PRE-", "IN BETWEEN" AND "POST-SCREENS" FOR GROUNDWOOD

	"In Between" Screens	"Pre-" and "Post-Screens"		
Screen types	Jonsson	Jonsson	Jonsson	Lindgren
Type of screen plate	Perforated	Perforated	Perforated	Slotted
Hole Diam. or slot width—inches	0.10	0.08	0.05	0.014
Capacity—tons (o.d./day	22	20	11	55
Motor—h.p.	2.5	2.5	2.5	15
Shower water USGPM/daily ton (o.d.)	2	0.7	0.7	2.6
Feed				
Consistency—%	0.6	0.7	0.7	1.6
Sliver Content—%	16	1.5	1.5	1.2
Accepted Stock				
Consistency—%	0.4	0.67	0.67	1.48
Sliver content—%	10.5	0.7	0.3	0.7
Rejected Stock				
Percent of feed	8	0.8	2.0	26.5
Sliver yield	35	40	80	61
Good stock loss	2.5	0.2	1.8	25.8

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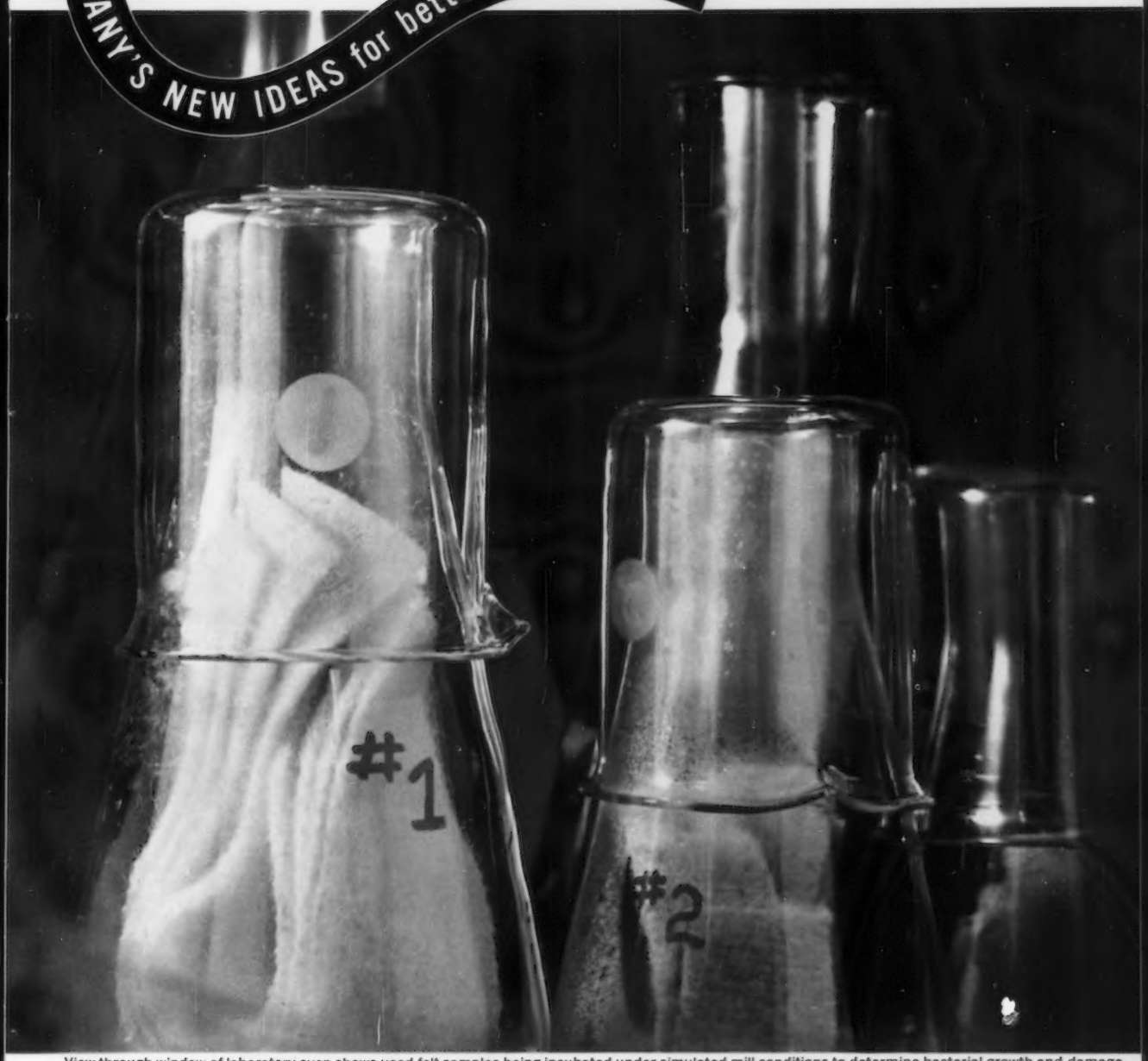

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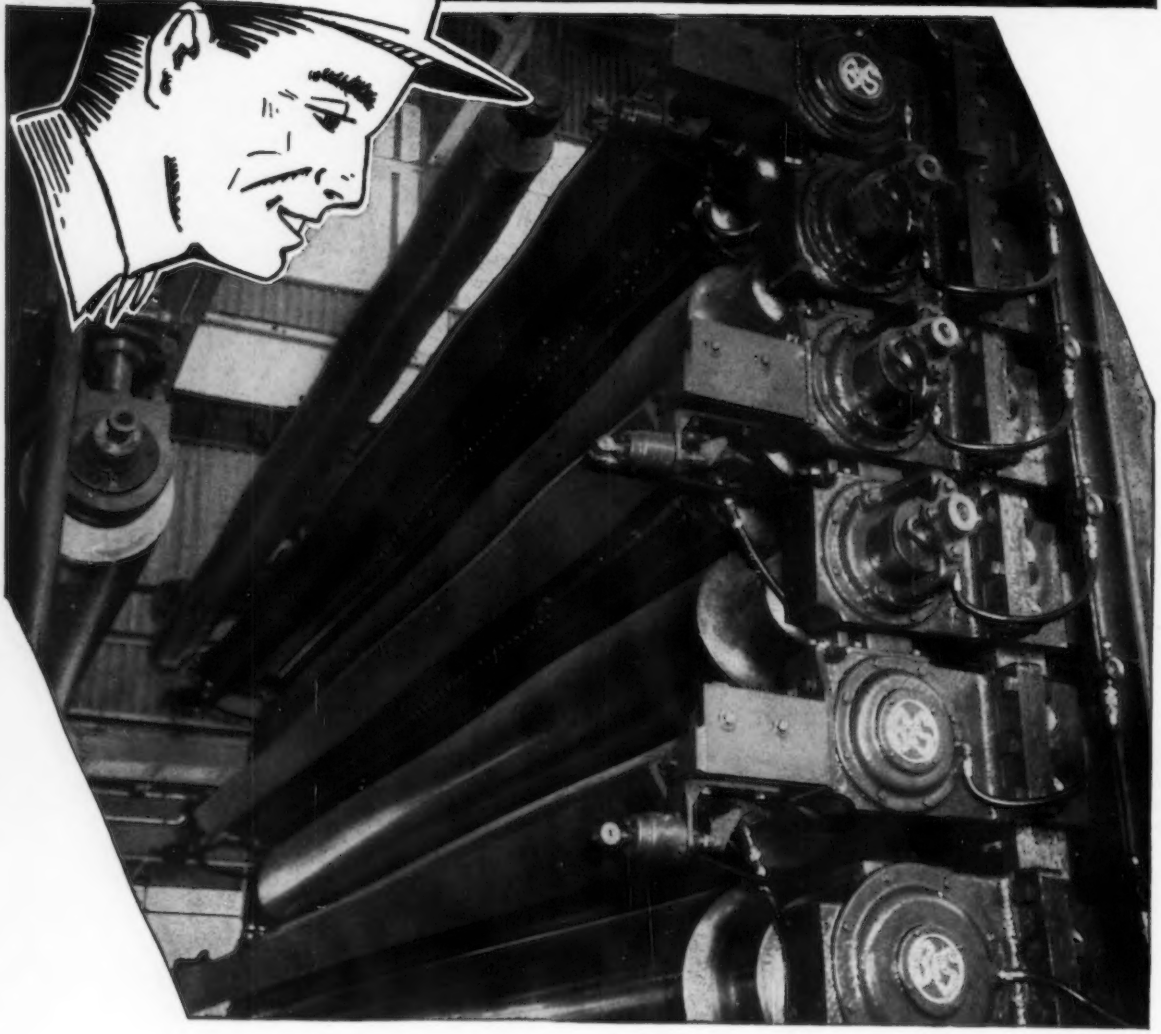

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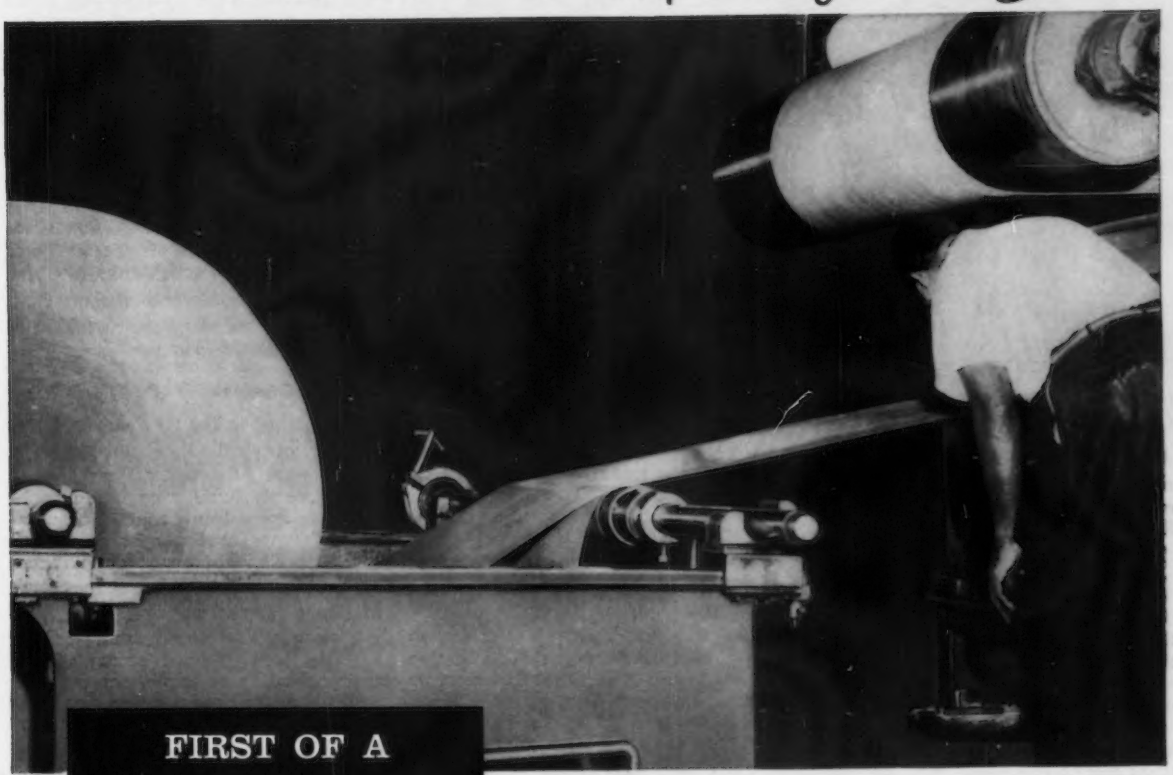

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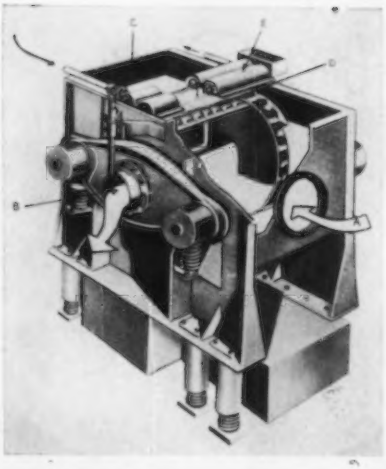


FIGURE 11—PRINCIPLE OF A LINDGREN (VIBROTOR) SCREEN

A—Stock feed; B—Accepted stock outlet; C—Overflow weir; D—Showering of rejected stock; E — Catch flume for rejected stock.

thick slivers to pass. With slotted plates, the short, thick slivers can be removed effectively but the long slivers pass more easily. Therefore, with double screening of the kind described, the advantages of the two different screen types can be combined.

The Jonsson Screen

The Jonsson screens shown in Figure 10 are vibrating flat screens. The entering stock is fed to the screen trough (a) by specially constructed inlet hoppers (b). The vibrations (about 1400 per minute) are introduced by a 5 h.p. motor and an eccentric shaft (c) which is arranged so that the retained, rejected stock is moved along to the end of the screen plates. Before this can leave the screen and enter the trough (d), it must pass through strong showers (e_1, e_2) which wash out all fine particles. The good stock which passes through is collected in a trough below the screen plate (f) and overflows the dam (g) to the accepted stock flume (h). Generally, the use of this type of screen ahead of the first screening stage as secondary coarse screens is only provided for very fine grades of groundwood. Capacity is comparatively low (see Table VI) and, therefore, the installation of flat screens at this location is recommended only for the smaller mills. This also applies to their use for double screening the accepted stock where the total production would have to be handled. However, between the first and second stages, the amount of stock is already greatly reduced and these screens can be used to advantage even in the larger mills. Efforts to use the Jonsson screen with slotted plates were not successful because, with slots wider than 0.014 inch, too many slivers pass and with narrower slots, the capacity decreases rapidly.

Vibrating Drum Screens

Originally, revolving drum vibrating screens were restricted to the Bird screens on paper machines. However, the further development of this principle resulted in designs suitable for a broad field of screening operations. Modern screens of this type are the Lamort, Lindblad, Lindgren and Voith vibrating screens. As an example, the detailed construction of the Lindgren screen (known on this continent as the Bird Vibrotor Screen) is described.

With the Lindgren screen (7), as shown in Figure 11, the feed stock enters at one side from the trough (A). The finer particles pass the slots of the screening drum and are removed from the inside at (B). The coarse fibers remain on the outside of the slotted plates and are washed off by water jets (D) as the drum passes the highest point, and are caught in the trough (E). A disadvantage of vibrating screens of this type is that they must be operated with an overflow (C) which it is recommended should be at least 20 per cent. This makes their arrangement within a screening system difficult. From the rather limited experience available, the indication is that the slots should not be wider than 0.014 inch and, for groundwood, preferably 0.012 inch. For a capacity of 55 tons (o.d.) per day, a 15 h.p. motor is required. The shower water consumption is 2.5–3.0 U. S. gal/min./daily ton (o.d.). This design should be suitable for "pre-screens," "in-between screens" and "post-screens" and the combination of slotted and perforated plates in series should be advantageous. As far as we know, however, not all the problems related to the practical use of these screens in groundwood systems have been solved and their use in this field, as yet, is not very common.

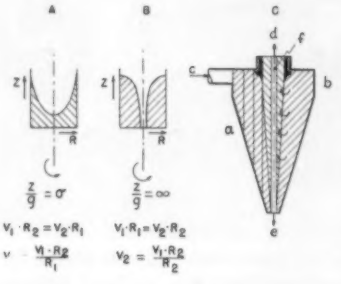


FIGURE 12—WORKING PRINCIPLE OF THE VORTEX SCREENS

A—Vortex principle. B—Centricleaner principle; C—Working principle of a centricleaner. a—Sharp cone; b—Cylindrical head; c—Tangential stock inlet; d—Stock outlet (same diameter as c); e—Rejected stock outlet (diameter, $\frac{1}{2}$ to $1\frac{1}{2}$ of c), depending on the prevailing pressure; f—Fluid free space (a little smaller than e); v_1—Tangential velocity with radius r_1; v_2—Tangential velocity with radius r_2; z—Centrifugal force; g — Gravitational acceleration //// — Downwards directed flow; \\\\ — Upwards directed flow.

Vortex Cleaners

In contrast to the very slow progress in the introduction of screens using slotted plates, the vortex type cleaners have recently found very broad application in groundwood mills. The number of types available has increased rapidly and, without any doubt, there are many excellent constructions such as Bauer centri-cleaners, Dirtecs, Vorject cleaner, Vortrap, Hydrafuge, Odag and the Voith Vortex screen. From their operating principle, designs with and without a central guide pipe must be considered separately (see Figure 12. A — vortex principle and B — Centri cleaner principle). As shown in the figures, with the Centricleaner, there is a sharp increase in the centrifugal force and in the stock r.p.m. from the outside towards the axis whereas with the vortex principle, the centrifugal force decreases towards the axis and the r.p.m. are constant (see Tomlinson and Tuck (8).

During practical operation, with the Centricleaner, layers with different velocity exist from the periphery to the axis (Figure 12c). The resulting shearing forces seem to be essential for the separation of the dirt from the good fibers because they affect the water, fibers and dirt differently. The prevailing forces are:

1—Pressure difference between the periphery and axis, and between the top and bottom of the cone.

2—Centrifugal forces in the rotating fluid layers.

3—The angular velocity gradient between periphery and axis.

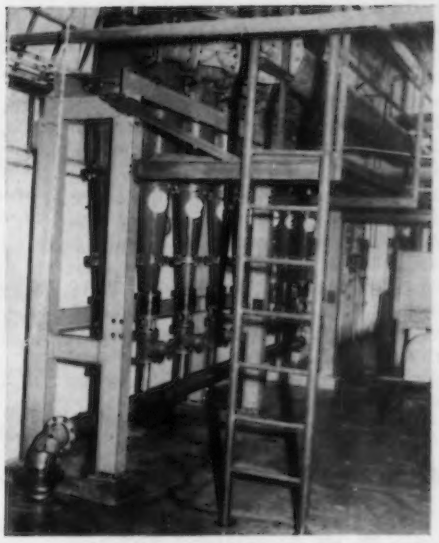
The principle of the Centricleaner can be explained by the following concept. The pressure differences provide the flow through the cone towards the orifice. Fibers and dirt pass the layers of

increasing centrifugal force and, in doing so, their inward velocity decreases according to their diameter. If a dirt particle enters a centrifugal field which balances its radial velocity, it is carried by the downward stream to the orifice. The fibers, according to their length, reach layers of different tangential velocity. The result is that they are carried toward the axis and finally upward in the rising stream existing at the axis. It is possible that the downward force is not sufficient to overcome the centrifugal force with particles of a certain dimension. In this case, they rotate in a set zone until displaced enough to be carried either upward with the accepted stock or downward with the rejected. The existence of such a zone indicates a failure in the choice of the dimensions for the particular condition and must be corrected either by increasing the diameter of the cones keeping the same ratio between the size of the inlet and outlet or by changing the ratio between the inlet and outlet but holding the same cone diameter. In both cases, the centrifugal forces are decreased. The rejects are bled off continuously and contain a certain amount of good fibers. It is, therefore, always essential to provide a secondary and possibly a tertiary Centricleaner stage in which these fibers are recovered. Optimum cleaning can be expected with feed consistency between 0.2 and 0.3 per cent. Capacity data are given in Table VII.

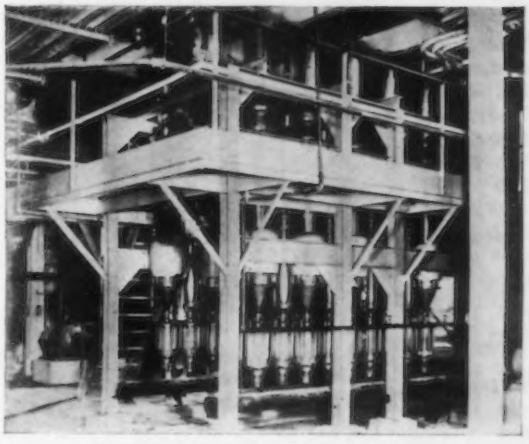
The success of an installation of vortex type screens depends very much on the correct choice of the design and the dimensions to suit the particular dirt, stock and degree of cleanliness required. When considering such an installation it must be realized that the power consumption is high (practical experience has indicated about 4–5 h.p. day/ton (o.d.) of feed) and that the accepted stock is obtained in a very dilute state. It is, therefore, recommended that vortex screens be restricted to special points in the system. The re-screening of the total amount of accepted stock from a screening system is recommended only for very fine grades of paper because of the high energy consumption and the dilute state of the accepted pulp which materially reduces the capacity of the filters and thickeners. However, vortex screens are recommended for re-screening the accepts from the secondary and refiner stages. The amount of stock to be handled then is not more than one-third to one-quarter of the total production. The consistency of the accepts from these screens is already very low and a special purpose is fulfilled because the short, thick slivers characteristic of the accepts from these stages can be removed. Such an installation arranged in two stages to handle 50 tons (o.d.) accepts from the secondary and refiner stages (50-65 p.s.i. inlet pressure and 0.2–0.25 per cent consistency) would reject about 1.0 per cent of the feed. Related to the total production, this is equivalent to 0.09 per cent. A visual examination shows that the short, thick slivers do, in fact, form a high percentage of the rejects and it is recommended that these should not be processed further but delivered to the sewer.

Most recent installations provide two stages of vortex screens. The amount of rejects is 1.5 to 2.0 per cent and 4.0

FIGURE 13 — INSTALLATIONS OF VORTEX SCREENS



A—Bauer cleaners



B—Dirtecs

TABLE VII— CAPACITY DATA FOR BAUER CLEANERS

Capacity		Inlet Pressure Required—p.s.i.		
Slush Stock — USGPM	Tons (o.d.)/day (0.3% consistency)	Type 2" x 2"	Type 3" x 3"	Type 4" x 4"
100	1.5	11	3	1.5
200	3.0	40	10	6
300	4.5	—	20	10
400	6.0	—	30	15
500	7.5	—	50	20
600	9.0	—	—	30
700	10.5	—	—	40
800	12.0	—	—	45
900	13.5	—	—	55

to 6.0 per cent from the first and second stages respectively. The accepts from the second stage are recirculated to the inlet of the first stage while the rejects are sewered. As examples, Figure 13, shows a Bauer Centricleaner (A) and a Dirtec (B) installation for groundwood. It is not possible to give data on the dimensions and capacities of the different types because these vary considerably with the conditions prevailing. To give one example which may indicate the range, the Centricleaner 2x2½ inch, at 35 p.s.i. inlet pressure and with 0.4 per cent consistency feed, has a capacity of 2.75 tons (o.d.)/day if used for re-screening the accepts from the later screening stages.

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WASTE PAPER
A Year End Review and Outlook

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President, NAWMD Waste Paper Institute

Reviewing the year of 1957, we look back on a year in which the paper, paperboard, and roofing mills ran on a curtailed basis. This was due in part to the overall decline in business felt in many industries and to over-expansion tonnagewise of the paper mills, predicated on a continuing strong market for their material.

Due to the limited backing on orders, the paperboard mills, along with the roofing mills, cut back on running time throughout the year. This condition caused the supply of the tonnage grades (news, mixed, corrugated) generally to exceed the demands of the mills, keeping the prices at a relatively low level; corrugated was the only low grade to show any firmness to speak of during the year. This fact has made it exceedingly difficult to run a packing plant profitably. In many instances packing operations have been curtailed to enable the waste paper packer to minimize his losses.

No. 1 books and magazines, which is a grade of considerable tonnage, has been a difficult item to move since the few markets which remain for this grade bought very sparingly over the year. The demand for better quality paper at the consumer level has forced the large users of No. 1 books and magazines to substitute more virgin pulp to meet the competition of the integrated mills.

The processed grades, such as colored and white ledger, have not been in a strong position over the year. Scotch tape, rubber adhesives, metallic and plastic-based inks have lost many markets for this material. Only mills with up-to-date equipment are handling this stock; still they have their share of trouble. However, a new machine has been developed and recently put into operation which gives promise of being able to cope sparingly with these prohibited materials, thus giving colored and white ledger grades an opportunity to find increasing markets in the near future.

The high grades of waste paper which are considered as direct pulp substitutes have been moving well over the year with very little price fluctuation. Little change is expected in these grades unless there is some future move in pulp prices.

Looking forward through 1958, we trust the paper market will right itself by midyear and that the remaining half of the year will show a substantial improvement for the waste paper dealer.

Evaporator Problems in the NSSC Recovery Cycle

The main problem . . . fouling of the heating surfaces . . . can be satisfactorily solved by proper application of either the long tube vertical or forced circulation evaporator. Still to be resolved is the problem of corrosion of evaporator equipment.

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The increasing production of neutral sulphite semichemical pulp has intensified interest in suitable processes and equipment required to recover the spent pulping chemicals. Part of the present spent liquors are being combined with kraft liquor and processed through the conventional kraft recovery system in what is termed cross-recovery. However, many mills now producing semichemical pulps do not have kraft recovery and must necessarily adopt one of the existing or proposed NSSC recovery systems if they wish to reuse any part of their cooking chemicals. Most of these recovery cycles require evaporation of the spent pulping liquor to a concentration suitable for combustion in a recovery furnace. Today there are several evaporator installations concentrating the straight NSSC liquors for these recovery cycles. Some of these are comparatively recent installations, so at this stage our contribution must be limited to a report on some of the evaporator problems encountered, their solutions and the areas in which additional information is required.

Severe Fouling is Main Problem

Early work in the evaporation of combined NSSC-kraft liquors indicated increased fouling of the heating surfaces and corrosion as compared with normal kraft experience. It seemed logical that these problems would be more severe with the straight NSSC liquor, and we now know this to be the case.

To meet the fouling problem, two types of evaporators are being used. One is the conventional long tube vertical evaporator normally used in the recovery of kraft and soda liquors. The other is the forced circulation evaporator frequently used to concentrate acid pulping liquors and generally applied to overcome fouling problems in the chemical industry. The most obvious difference between the two types is the high liquor velocity maintained across the heating surface of the forced circulation unit. This liquor velocity is maintained by a large pump continously circulating liquor from the vapor flash chamber back through the heating surface. This circulating system makes the first cost and power consumption greater for the forced circulation units.

Scale Formation Reduces Capacity

In late 1953 and early 1954 a mill began recovery of NSSC liquor employing a direct sulphiting system developed by the Institute of Paper Chemistry. The evaporator was a six-body quintuple-effect long tube vertical unit originally installed when this was a kraft mill.

Soon after the mill converted to the NSSC operation it became evident that the maximum evaporator capacity was less than that obtained with kraft liquors. The difficulty was quickly traced to fouling of the heating surfaces and samples were obtained for analysis. Scale consisting mainly of calcium oxalate formed on the liquor side of the tubes in the low temperature effects. The liquor side of the tubes in the high temperature effects was scaled with calcium carbonate, calcium sulfate and calcium sulfite. All of the scales tested contained about 15 to 20 per cent organic matter. Calcium enters the system with the wood, and the degree of barking practiced might influence the amount of scale encountered.

To maintain production it was necessary to make frequent chemical cleanings of the heating surface. In time these cleaning procedures were improved so that downtime was reduced and the overall evaporator capacity increased. Stainless steel tubes were installed in all effects to minimize the tendency for tube fouling and to replace the original steel tubes which were showing definite signs of corrosion.

As a result of the above and generally improved operating technique with the entire recovery cycle, the long tube vertical evaporator successfully concentrated the NSSC liquor to a discharge of about 45 per cent total solids. Its capacity was still somewhat less than obtained with kraft liquors, but the operating problems and costs due to scaling of the heating surface had been brought under control.

Later on this same mill installed a forced circulation first effect to form a sextuple-effect evaporator. The forced circulation addition provided increased evaporation capacity, increased per cent total solids discharge and decreased steam consumption.

Concentrated Liquor is Thixotropic

In 1954 a test program on NSSC evaporation was conducted by the Institute of Paper Chemistry in their facilities at Appleton, Wis. The test work was performed in a forced circulation evaporator of sufficient capacity to provide reliable heat transfer data and demonstrate scaling tendencies. Feed liquor was obtained from a mill recovering NSSC liquor by the direct sulphiting method. Conditions were varied to simulate operation of individual effects of a multiple effect evaporator.

The tests demonstrated that this type of forced circulation evaporator could be used to concentrate this particular NSSC liquor to 60 per cent total solids

without scale forming on the heating surfaces.

The Institute also investigated some of the physical properties of the NSSC liquor. They noted that high concentration liquors tend to solidify to a gel which can be made fluid again with sufficient agitation. This property—termed thixotropy—makes it difficult to establish liquor viscosities at high concentrations. The effect upon evaporator design is considerable. Normally a change in the circulation rate will affect the best transfer coefficient because of changed liquor film velocity. With a thixotropic liquor the coefficient will also change because of the change in apparent viscosity due to the difference in agitation.

This suggests two approaches to the design of a high concentration effect. Providing a high rate of circulation assures liquor flow in the turbulent region with predictable high heat transfer coefficients. This means small heating surface requirements but high power demand. Providing a low rate of circulation results in liquor flow in the transition or streamline zone with low heat transfer coefficients expected. This requires much more heat transfer surface, but there would be a power saving if the change in viscosity was not too great. The choice of design would be governed by factors of cost and power availability.

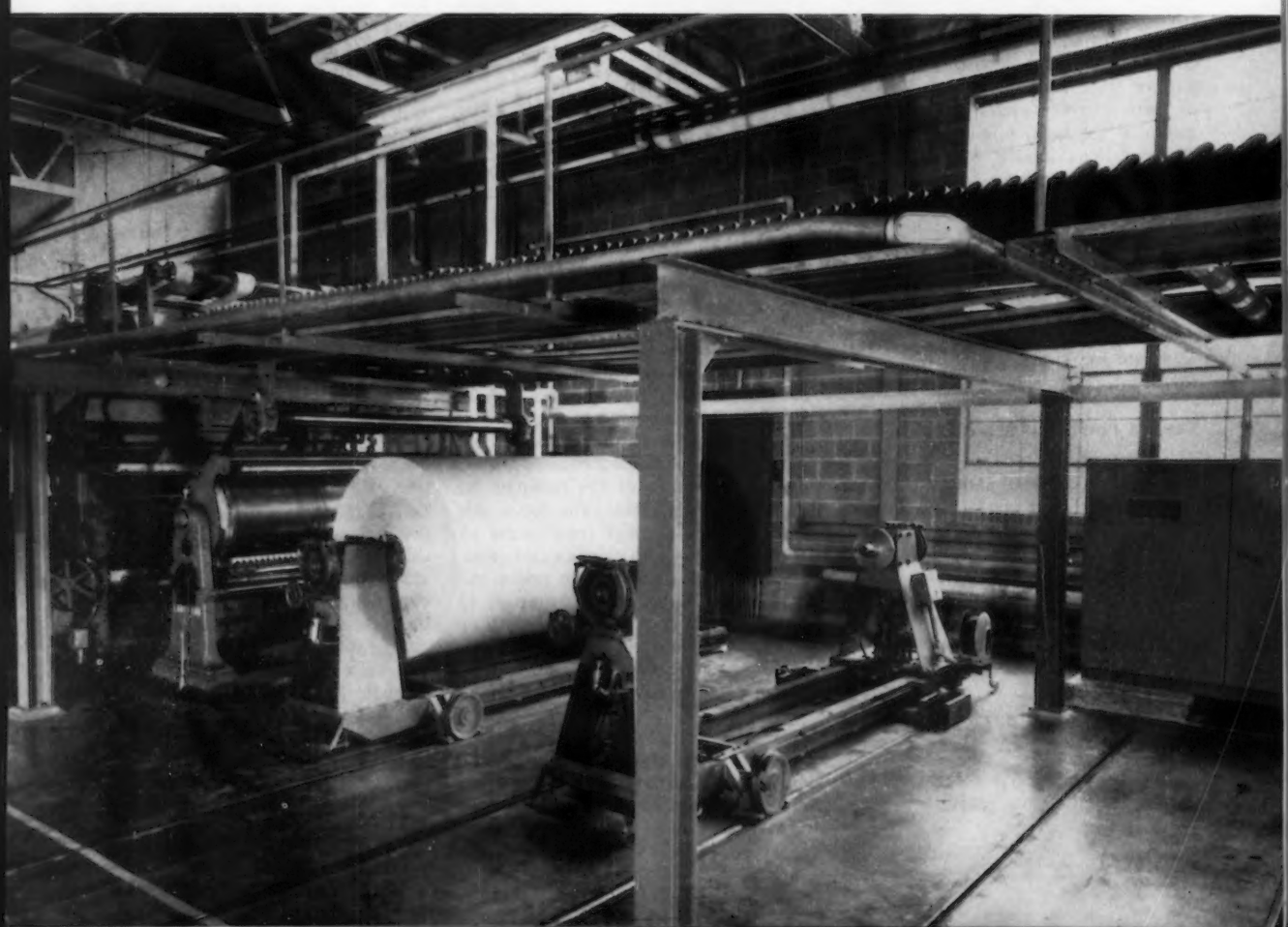
Forced Circulation Required for High Concentration

In 1953 a mill size pilot run was conducted on the Bradley recovery system. The Bradley system is designed to convert a sodium base sulphite or NSSC liquor to a liquor which is chemically similar to kraft. This would permit handling in the usual kraft recovery equipment.

A combination of long tube vertical and forced circulation units were installed in the evaporator pilot plant. The forced circulation unit was required to concentrate its liquor to the desired 65 per cent total solids, which is beyond the ability of a long tube vertical unit. To obtain satisfactory operation, certain conditions had to be provided. At 65 per cent total solids the liquor apparently polymerized to a very heavy syrup. Storage between the evaporator and recovery furnace had to be made at not over 45 per cent total solids with final concentration to 65 per cent total solids followed immediately by burning.

The presence of wood calcium resulted in a soft scale of calcium sulphite and the precipitation of considerable quantities of solid phase calcium lignosulphonate. Both of these problems and a comparable insolubility of organic sodium compounds were corrected by the addition of sodium carbonate and adjustment of the feed liquor to a minimum pH of 10.8. When handled in this manner the liquor was successfully concentrated to 65 per cent total solids.

In 1955 an NSSC recovery system employing the Mead recovery cycle was erected. To concentrate the spent liquor a triple effect all forced circulation evaporator was installed. The decision to use forced circulation was based on three points. First, because of the small size of the evaporator there was little difference in price and operating cost between forced circulation and long tube vertical. Second, their plant operating personnel were not experienced with the operation of evaporators so the reduced scaling problems to be expected with forced circulation evaporators would avoid operating complications. Third, the Mead process



involves a carbonation step followed by sulphiting as compared with the direct sulphiting method upon which our previous long tube vertical experience was obtained.

The heat transfer data and non-scaling tendencies of the forced circulation evaporator demonstrated at the Institute of Paper Chemistry were confirmed on this unit operating with Mead process liquors.

Corrosion

Opinion varies widely as to the proper materials of construction and fabrication techniques to withstand corrosion in evaporators handling NSSC liquors. Much of the background on this subject comes from mills having handled NSSC liquor in equipment other than evaporators. This information is a valuable guide but not necessarily applicable to the evaporators. More complete data is being gathered by installing test corrosion spools in the existing evaporators, and this program will be extended to the evaporators now being fabricated. To be reliable these test spools must be subjected to the operating conditions for some time so the results of this work are not available.

All short period tests and mill experiences have indicated that the water vapor from NSSC liquors is more corrosive than the liquor itself. This is attributed to the hydrogen sulphide released from the liquor at the low pH level. Some of the corrosion tests indicate that Type 304 stainless steel is as resistant as Type 316 stainless steel. However, a number of the mills have reported failures with Type 304 stainless that were cured by converting to Type 316. There have also been reports of failures of both Type 304 and Type 316 stainless steel due to corrosion adjacent to the welds resulting from carbide precipitation during welding. This can be avoided through use of extra low carbon stainless steels.

Most of the new NSSC evaporators have been fabricated of a combination of mild steel and stainless steel. In general, parts of the evaporator which would be difficult to replace or repair have been fabricated of stainless steel. This refers particularly to the heating element shells on all but the first effect and the tubes and tubesheets of all effects. Where stainless steel has been used, the choice has been between Type 304 ELC and Type 416 ELC.

Summary

An increasing number of mills are installing NSSC evaporators as part of an NSSC recovery cycle. Some mills now practicing cross-recovery would prefer to handle the NSSC liquor in a separate evaporator to avoid the detrimental effects of the mixed liquors in their kraft evaporators.

Construction and testing of a number of NSSC evaporators has provided reliable data upon which to base future installations. The main problem— fouling of the heating surfaces—can be satisfactorily solved by the proper application of either the long tube vertical or forced circulation evaporator. The choice between the two is based on economic factors, such as capital and operating costs, desired liquor discharge concentration and ability of the operating force to cope with periodic surface cleaning problems.

The problem of corrosion of the evaporator equipment is not as well resolved. A variety of materials of construction are being used and only time will demonstrate the correct course.

Paper presented at the Sixth Annual Pulp and Paper Conference, held December 2-3, 1957, at the University of Florida, Gainesville, Fla.

Westinghouse AV-DRIVE gives 10-second minimum to maximum corrugator capacity

Smooth, controlled deceleration is provided by a Westinghouse AV-Drive for this corrugator at the Eddy Paper Corporation. Now this unit can be slowed from 600 to 60 fpm in as little as 10 seconds, while necessary changes are being made for another order.

After a year of almost constant operation, Westinghouse AV-Drives are still giving top-notch, trouble-free performance at this installation.

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PRICES OF FIBERS

MARKET WOOD PULP

FIRST QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$$90.00/ —	$$90.00/ —	$$90.00/ —
Bleached Gw'd.	$97.50/100.00	$97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	$157.00/162.50*		$157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		$137.00/ —		
Kraft, Semi-bleached	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		134.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

$ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

New Domestic Cotton Cuttings

Delivered Mill Basis
PRICES NOMINAL

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.00
No. 1 Unblchd. Muslins	16.00/ 16.50
Blchd. & Unblchd. Underwears	15.00/ 15.50
No. 1 Light Silesias	7.00/ 7.50
No. 1 Light Blue Overalls	7.25/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.25
Suntan Khakis	5.50/ 6.00
Cottonades	3.25/ 3.75
No. 1 Washables	2.50/ 2.75

Old Domestic Cotton Rags

(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.00/$3.25
Cotton Pants & Overalls	2.00/ 2.25
Twos and Blues, Repacked	1.50/ 1.75
No. 2 Roofing	

COTTON LINTERS

Memphis Market

f.o.b. Oilmills

Week Ended January 13		For 100 lbs.
Grade 1 n.a.		
2	1 cut—felting	$9.50/ $9.25
3	1 cut—felting	8.50/ 8.00
4	1 cut—felting	7.75/ 7.00
5	1 cut—felting	6.75/ 6.25
6	1 cut—felting	6.00/ 5.50
7	1 cut—felting	5.25/ 5.00

*Based on 73% cellulose.

Old Rope & Bagging

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts (soft)	$6.00/$6.50
Scrap Burlap	
Australian Wool Pouches	5.00/ 5.37
Gunny	4.75/ 5.00
No. 1 Domestic Manila Rope	7.75/ 8.25
No. 1 Foreign Manila Rope	6.25/ 6.50
Domestic Sisal Strings	

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	January 13	January 13	January 13	January 13
No. 1 Mixed Paper	$4.00/ 6.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	13.00/ 15.00	14.00/ —	14.00/ —	12.00/ —
Overissue News (Lg. size)	16.00/ 18.00	12.00/ 14.00	19.00/ —	16.00/ —
Mill Wrappers	11.00/ 13.00	12.00/ 14.00	7.00/ —	13.00/ —
Old Corrugated Containers	21.00/ 22.00	20.50/ 21.00	22.00/ —	20.00/ —
Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 42.50	35.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts (Semi-chem. medium)	25.00/ 30.00 45.00/	35.00/ 37.00 45.00/ —	35.00/ — 45.00/ —	30.00/ — 35.00/ 45.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	55.00/ —	40.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	55.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	65.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	25.00/ 30.00	24.00/ 30.00	16.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	52.50/ 57.50	40.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	60.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	70.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/110.00	90.00/ —	85.00/ 90.00
Hd. White Env. Cuts	115.00/125.00	120.00/130.00	100.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 60.00	55.00/ 62.00	47.50/ —	42.50/ —
Manila Tab. Cards	60.00/ 70.00	70.00/ 75.00	65.00/ —	75.00/ —
No. 1 Col. Ledger	28.00/ 33.00	30.00/ 35.00	40.00/ —	22.50/ —
White Ledger	45.00/ 50.00	50.00/ 55.00	52.50/ —	35.00/ —
Mixed Book & Mag.†	18.00/ 19.00	19.00/ 20.00	12.00/ —	— / —
No. 1 Books‡	25.00/ 27.00	22.00/ 24.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:		
coml. bulk, c.l. wks.	cwt. 2.00	/ —
iron-free, c.l. wks.	cwt. 3.55	/ —
Casein, acid prec.:		
dom. sh. pt. c.l. (30 mesh)	cwt. 56.00	/ —
Arg. ex. dock	cwt. 20.75	/21.50
New Zealand	cwt. 24.00	/25.00
Caustic soda:		
c.l. wks. solid, 76%	cwt. 4.30	/ —
flak. & grd. drums, c.l.	cwt. 4.70	/ —
liquid 50% tanks	2.90	/ 3.00
liquid 73% tanks	3.00	/ —
China Clay		
dom., dry-grd., airfloat:		
325 mesh bgs., c.l. Geo.	ton 10.00	/ —
300 mesh, bgs., c.l. Geo.	ton 13.50	/14.50
imp., white, lump, c.l. ex. dock	20.00	/35.00
Chlorine:		
single-unit tanks, works	cwt. 3.15	/ —
multiple unit, 2-5 cars per yr.	5.25	/ 4.05
Lime:		
hydrated, bulk, c.l. N.Y.	ton 23.63	/ —
quicklime, bulk, c.l. N.Y.	ton 22.13	/ —
Gum rosin:		
K, M, N, drums, c.l. Savan.	cwt. 7.57	/ 7.70
Rosin size:		
70%, gum & pale paste, tank cars, south, sh. pt.	cwt. 7.38	/ 7.48
Saltcake:		
dom. bulk, 100% anh. wks.	ton 28.00	/ —
Soda ash:		
light, 58% ash bags, wks.	cwt. 1.85	/ —
bulk, c.l. wks.	cwt. 1.60	/ —
Sodium chlorate:		
drums, c.l., wks.	cwt. 9.00	/ —
drums, l.c.l., wks.	cwt. 9.50	/10.50
Sodium peroxide:		
dms., c.l. E. of Miss.	lb. .20½	/ —
l.c.l. (same basis)	.21	/ .21½
Sodium silicate, 40° Be.:		
tank-cars, wks.	cwt. 1.20	/ —
drums, c.l. wks.	cwt. 1.55	/ —
47° Be. WW.		
tank-cars, c.l. wks.	cwt. 1.90	/ —
drums, c.l. wks.	cwt. 2.25	/ —
Soybean, protein:		
chem. isol., wks, c.l. bags	lb. .23	/ —
Starches:		
Corn, multiwalls, c.l. prod. plant:		
pearl	cwt. 6.49	/ 6.75
white, dextrins	cwt. 8.08	/ 8.20
chlorinated	cwt. 8.25	/ 8.35
potato, Idaho, c.l. wks.	cwt. 6.50	/ —
East, fr. all. 50 cents cwt.		
potato, Maine, f.o.b. wks.	cwt. 6.25	/ —
Sulphuric acid:		
60° Be. cbys. c.l. wks.	cwt. 2.00	/ —
l.c.l. wks.	cwt. 2.45	/ —
tank-cars, wks.	ton 18.60	/ —
Sulphur:		
crude, c.l. mines, contract,	long ton 23.50	/ —
f.o.b. vessels Gulf dock	ton 25.00	/ —
Sulphur dioxide:		
liquid, coml. cyl., wks.	lb. .10	/ .12
multi-unit cars, wks.	lb. .0535	/ —
Talc, fibrous grd., bags:		
c.l. wks., N.Y.	ton 28.00	/ —
l.c.l. wks., N.Y.	ton 31.00	/36.00
Titanium dioxide:		
anstase, c.l. dlvd. E. bags	lb. .25½	/ —
l.c.l. dlvd.	lb. .26½	/ —
rutile, c.l. dlvd.	lb. .27½	/ —
l.c.l. dlvd.	lb. .28½	/ —

PAPER PEOPLE

Donald S. Leslie

W. Kenneth Brew

Named President of Watervliet

Donald S. Leslie, president of the Hammermill Paper Co., Erie, Pa., has been named president of the Watervliet Paper Co., Watervliet, Mich., a subsidiary company. Mr. Leslie succeeds George K. Ferguson who retired January 1.

Replacing Mr. Ferguson as general manager is Fred Bahrenburg who has been named as executive vice president and general manager at Watervliet. Mr. Bahrenburg has been plant manager at Hammermill.

Newton Falls Personnel Changes

The following changes have been made in the organization of the Newton Falls Paper Mill Inc., Newton Falls, N. Y.:

George S. Carroll, asst. to general manager; Russell L. Clark, general superintendent; J. Wayne Morrow, asst. general superintendent; Gordon D. Black, paper mill superintendent; Melvin Nolan, coating plant and finishing superintendent; Kenneth Ross, technical director; Arthur C. Smith, plant engineer; John E. MacAleese, asst. plant engineer; Ralph E. Beaulieu, director of purchasing; Francis J. Foley, asst. treasurer; Ross F. Riley, production & traffic manager; Alex M. Ross, vice president in charge of woodlands & mining operations; Guy L. Ashley, exec. asst. to president in charge of sales; Joseph F. Morrison, district sales manager; Esther C. Hynes, personnel director & cashier; and Helen Koziol, administrative asst.

New APPA Assistant Executive Secretary

W. Kenneth Brew has been named Assistant Executive Secretary of the American Paper and Pulp Association. Mr. Brew succeeds Robert E. O'Connor, Association Secretary, who was recently promoted to the Executive Secretary position vacated by the death of E. W. Tinker.

Mr. Brew's experience with the paper industry covers 20 years of sales management in the paper products field. His latest position was general sales manager for the Royal Lace Paper Division of the Eastern Corp. A business graduate of Western University and Dartmouth College, he took graduate work in law at the John Marshall School of Law and is a member of the Ohio Bar.

Smith Slated for T & H Vice President

Herbert P. Smith will become vice president sales of Tileston & Hollingsworth Co., Boston, on March 1.

Riegel Advances Endicott

Riegel Paper Corp. has appointed Winthrop Endicott manager of merchant and industrial sales. Mr. Endicott joined Riegel in 1939, and was previously product manager, packaging material sales. He succeeds J. Bicknell Lockhart Jr., recently elected vice president, who now becomes vice president, administration. William Riegel, formerly a product supervisor, was appointed to Mr. Endicott's previous position.

Diamond Gardner Names Public Relations Chief

Dean K. Phillips has been appointed manager of public relations of the Diamond Gardner Corp., New York City. He will be responsible for the development and administration of an enlarged public relations program for the multi-product company.

Before this appointment, Mr. Phillips was director of public relations for the Gardner Division (formerly Gardner Board and Carton Co.) of the Diamond Gardner Corp. He joined Gardner in 1950 as assistant director of public relations. In 1954 he was promoted to director of public relations.

Penfield Retires from Gulf States

Willis E. Penfield, a vice president of the Gulf States Paper Corp., has announced his retirement. He had been associated with Gulf States and its predecessor for approximately 37 years. He had been a vice president of the company since 1956.

Meet Huyck's
LA RUE

John P. La Rue is Huyck's Assistant Field Service Manager, engaged in trouble shooting special mill problems. He is a graduate of M. I. T. and prior to joining Huyck was a sales engineer for the Montague Machine Co., manufacturers of pulp and paper mill machinery. John's group is proud of its reputation of being on call twenty-four hours a day for every papermaker in the United States.

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First in Quality . . . First in Service Since 1870

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The DRAPER Felt
DRAPER BROTHERS COMPANY
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Judge Clyne Elected to M & B Board

Election of John V. Clyne, former Judge of the Supreme Court of British Columbia, to chairmanship of the board of directors of MacMillan & Bloedel Ltd., Vancouver, was announced by Ralph M. Shaw, president, following a directors' meeting. Mr. Clyne was named a director at the annual general meeting immediately preceding the directors' meeting.

CZ Employee Benefits' Head Retires

J. T. Hughes, manager of employee benefits for Crown Zellerbach, has retired after 35 years of service with the corporation.

Mr. Hughes joined Crown Zellerbach as a member of the accounting department at Ocean Falls, British Columbia in 1922. He advanced steadily, becoming first manager of the newly formed Employee Benefits Department in 1951.

Peter D. Degnan, formerly group insurance supervisor, succeeds Mr. Hughes as manager of CZ's Employee Benefits Department. Mr. Degnan joined the corporation as secretary to the president in 1928.

S. S. Philbrick, who has been Mr. Degnan's assistant, moves up to group insurance supervisor.

Named by Union Bag-Camp

Union Bag-Camp Paper Corp. has announced the appointment of H. T. Scordas as technical advisor for the company's board sales division.

A member of the Union organization since 1937, Mr. Scordas set up and supervised the technical department for the company's corrugated box operations. More recently he served as superintendent of Union's corrugated box plant in Lakeland, Fla.

Phillip S. Bettoli

Appointed Ruberoid Director of Research

Ruberoid Co. has appointed Phillip S. Bettoli as the firm's director of research. Mr. Bettoli begins his new duties immediately, replacing Clarence R. Eckert, who is retiring.

Mr. Bettoli joined Ruberoid in 1945 as a research chemist, became chief research chemist in 1948 and has been assistant director of research since 1952. In his new position, he will be responsible for all product research and development with headquarters at the company's laboratories at South Bound Brook, N. J. From 1942 to 1945, Mr. Bettoli worked with the Hercules Powder Co.

Mr. Eckert, who had been Ruberoid's research director since 1945, was one of the pioneer chemists in the asphalt and coal tar building materials industry. For many years he was an independent consulting engineer in the field and holds a large number of patents.

Advanced at Lebanon

August C. Moncini, steam and power superintendent at Crown Zellerbach's plant in Lebanon, has been promoted to plant engineer, Lebanon.

G. E. Meyers

New Sales Manager for Blandin

G. E. Meyers has been appointed sales manager for the Blandin Paper Co., Grand Rapids, Minn. He has been associated with Blandin since 1933, and in the past has been production manager and sales representative.

Walczak Promoted at Consolidated

Stanley Walczak has been appointed tour foreman at the Wisconsin River Division of Consolidated Water Power & Paper Co. Mr. Walczak began his employment with the company in 1912 and has served as a machine tender for the past 15 years. He succeeds John F. Kryshak who recently retired after nearly 52 years of service.

Hughson Joins Biron Division

H. Max Hughson has joined Biron Division of Consolidated Water Power & Paper Co. as technical supervisor. Mr. Hughson has been employed by Provincial Paper Ltd., Port Arthur, Ontario, as control superintendent.

these windshield wipes boom sales for
melostrength* paper
Wet or Dry . . It's Stronger
melostrength* paper
Wet or Dry . . It's Stronger

REED TISSUE CORPORATION

Because there's a brighter outlook for motorists, there's a bright sales outlook for the Reed Tissues Corporation—thanks to KLEN-ZIT® Tissues made of MELOSTRENGTH® Paper*. Efficient, economical and disposable, they have established a new, permanent market in gas stations everywhere.

The MELOSTRENGTH Paper Symbol on each KLEN-ZIT package helped in creating initial acceptance. *Your* products, from tissues to tarpaulins, can also benefit from MELOSTRENGTH resin in product quality—from the MELOSTRENGTH symbol in buyer acceptance.

Buyers know that this nationally promoted symbol guarantees:

STRENGTH, WET OR DRY—stands up even when soaked
NON-LINTING . . . wipes clean without shedding
LASTING STRENGTH . . . in hard use, or in long storage

Cyanamid supplies MELOSTRENGTH Resin for the manufacture of MELOSTRENGTH Paper. MELOSTRENGTH Paper is available in practically every weight and grade from mills across the country.

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PAPER CHEMICALS DEPARTMENT
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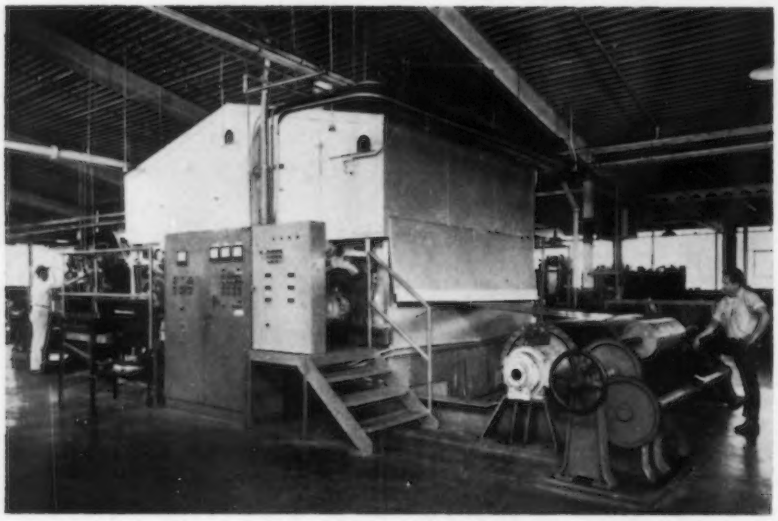
NEWS OF CONVERTERS



Fortifiber's specially designed equipment for creping, chemical saturation and plastic coating.

Fortifiber Expansion Nears Completion

Addition of the newest, most modern equipment, and aggressive personnel, is bringing Fortifiber Corp.'s expansion plans, projected early this year, to rapid completion, according to the firm's vice president, D. V. Long.

Typical is the installation of equipment to provide precise patterns for reinforced papers in the Fortifiber line. It will now be possible to add nylon, rayon and Fiberglas to strengthen Fortifiber as needed to meet customer specifications. Other equipment being added in this expansion program will provide means for "creping," chemical saturation, plastic coatings, and non-staining laminants.

"We anticipate the ability to provide any known requirement for industrial paper, as well as papers with a wide application in the building and agricultural industry," said Mr. Long.

"Included in our program is the creation of a development laboratory, now well under way, under the direction of A. H. Herbst. It will have complete facilities for the creation and development of new products, testing, and rigid quality control."

Long also announced organizational changes in preparation for the marketing of Fortifiber products. Clifford R. Mack takes over as sales manager in the eastern United States, and will headquarter at the Fortifiber Memphis facility. Joseph M. Langr has been added to the staff to cover sales activities in the New York and New England areas.

Natl. Container to Start Kansas Plant

A new converting plant is being established in Kansas City, Mo., by National Container Corporation, a subsidiary of Owens-Illinois Glass Co.

Lester R. Edwards, National Container president, said production in the new plant will begin sometime during the first quarter of 1958. A two-shift operation, National's newest unit will eventually employ close to 100 persons.

The Kansas City corrugator will raise to 22 the number of corrugators National Container operates in 17 converting plants throughout the country.

Others are in Atlanta, Aurora, Ind., Bradford, Pa., Bristol, Pa., Chicago, Dallas, Detroit, Jacksonville, Fla., Long Island City, N. Y., Los Angeles, Madison, Ill., Miami, Milwaukee, Newark, N. J., Oakland, Calif., and Salisbury, N. C.

In addition, National Container operates sheet plants, which convert board from other plants, at St. Paul and Memphis.

CZ Sells Plant, Leases It Back

Crown Zellerbach Corp. today announced it has sold and then leased back on a long-term basis its multi-wall bag plant in Bogolusa, La. Spokesmen said the plant was purchased by New York Life Insurance Co. for approximately $1,900,000.

Worcester Box Buys Plant and Land

Worcester Paper Box Corp., Medford, Mass., has announced the purchase of the building and land of New England Bedding Co. at 50 Amarand Ave., Medford.

Harry Posner, president of Worcester Paper Box, said that the additional 130,000 square feet will enable his company to continue its expansion program. He stated that the corporation has been completely withdrawn from sale and that its development program will be conducted under its own management and direction.

Worcester Paper Box, which covers seven and a half acres of land, was established close to half a century ago and moved to its present site in 1927.

TV Film Shows Paper Use in Sick Care

As part of its series of TV films to promote the use of paper cups, containers, dishes and plates by homemakers, the Feld Research Division of the Paper Cup and Container Institute has recently produced a four and a half minute picture, "Sick Care When It's 'Catching'." This film, which is being offered free of charge, in both black and white and color versions to women's programs in all TV stations in the United States, gives tips for the care of a child who is ill with a contagious disease and shows how the use of all-paper service can prevent the spread of infection.

The picture offers ideas for making the sick room chores lighter. All-paper service is used, with plastic tableware. After use, the paper service and tableware are placed in a paper bag for disposal. Paper cup dispensers in kitchen and bathroom eliminate the hazard of spreading the contagion by members of the family sharing a drinking glass. Other sick care advice, such as how to clean a thermometer, is also included.

Clogston Manager Retires

Imperial Paper Box Corp., Brooklyn, N. Y., announces the retirement of Fred Traub Sr., manager of their subsidiary company, Clogston Paper Box Co., New Haven, Conn.

Harold M. Belmuth

Appointed Manager of Cheslam Div.

Chester Packaging Products Division of St. Regis Paper Co. has appointed Harold M. Belmuth manager of its Cheslam Division.

Mr. Belmuth has been associated with St. Regis since 1948 as district sales manager of their Panelyte Division and sales manager of their Chesflex Division.

The Cheslam Division manufactures and extrudes polyethylene film luminates including nationally known Cellothene.

U.S. Envelope Management Changes

Management changes affecting divisions of the United States Envelope Co. on the West Coast and in the southwest have been announced by Eldon V. Johnson, president.

Evert M. Anderson, now manager of the Southwest Division, will become manager of the Los Angeles Division and also general manager of both its West Coast divisions—the San Francisco Division at Emeryville, Cal., and the Los Angeles Division.

Gilbert L. Packer, assistant manager of the Southwest Division at Dallas, Tex., will be manager of that division.

The changes and promotions are occasioned by the impending retirement of Albert F. Duval, Sr., who has been general manager of the two West Coast plants since 1950.

Western Box Becomes Stone Container Div.

Western Paper Box Co., Detroit, has been designated a division of Stone Container Corp., Chicago, effective January 1, it has been announced by Marvin N. Stone, executive vice president of Stone Container.

Previously the Detroit firm, which produces folding cartons, set-up boxes and corrugated shipping containers, had been operated as a subsidiary. It operates plants at 1111 Bellevue and 6911 Lafayette and was acquired by Stone Container Corp. in January 1956.

Mead Subsidiary Acquires Box Plants

Mead Containers Inc., wholly owned subsidiary of Mead Corp., will acquire the total assets of Ottawa River Paper Co., Toledo, Ohio.

The Ottawa River Paper Co. was organized in 1923 in Toledo. The company's main plant, employing 230 men and women, at Toledo, and the branch plant located at Flint, Mich., employing 240 men and women, produce corrugated shipping containers and corrugated specialties for the automotive, glass and food industries in Ohio, Michigan, and Indiana.

There will be no change in the management and personnel of the Ottawa River Paper plants which will become the Ottawa River Division of Mead Containers Inc., under the management of Philip LeBoutillier Jr., Ottawa River Paper president, who will become a vice president of Mead Containers Inc.

The affiliation of Ottawa River Paper and Mead Containers will provide Mead Containers with a larger area for distribution of its corrugated containers, and extend Ottawa River Paper's service to larger markets in shipping containers and corrugated specialties.

BUILT FOR MORE ROUND TRIPS

BITUSIZE® *improves performance of heavy-duty, hard sized boards*

► Returnable beer cases have to "take a beating and come back for more." Rough handling, high stacking, and storage in damp or wet coolers are every-day "occupational hazards." Bitusize "B" is used by many case manufacturers to insure a high level of wet and dry strength in the board they use. *This means more round trips for every unit they turn out.*

When boxes, cases or cartons must stand up under such conditions, Bitusize "B," an integral sizing material, will considerably extend their "life-expectancy."

We will welcome an opportunity to answer any question you may have on the use of Bitusize. *Contact our office nearest you for complete information.*

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UNIFORM PRESSURE
Burst Strength Tester

For Papers or Boards

This instrument meets ASTM and TAPPI standards; also CCC Rule 41 (Cady or Mullen Test), with a record of more than 30 years service in the paper and board industry. Uniform pressure during 12 second cycle assures uniform test on papers or boards. Pressure registers in pounds per square inch on direct reading dial and remains at reading until next test is stated. Write for complete brochure describing operation in detail.

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PIONEER PAPER STOCK COMPANY

graders and packers of waste paper

Ohio Envelope Firm to Move

The American Paper Products Co., East Liverpool, Ohio, 41-year-old firm which manufactures commercial envelopes, will move to Youngstown, Ohio, where the firm is building a new envelope-manufacturing plant. Moving operations are expected to start late in April or early May.

Fulton Bag Sells Branch Plants

Fulton Bag and Cotton Mills of Atlanta, Ga., sold its branch bag manufacturing plants at New Orleans and St. Louis to a newly formed corporation, Fulton Bag and Products Co.

Principals who announced the transaction in New Orleans did not make public the financial consideration involved.

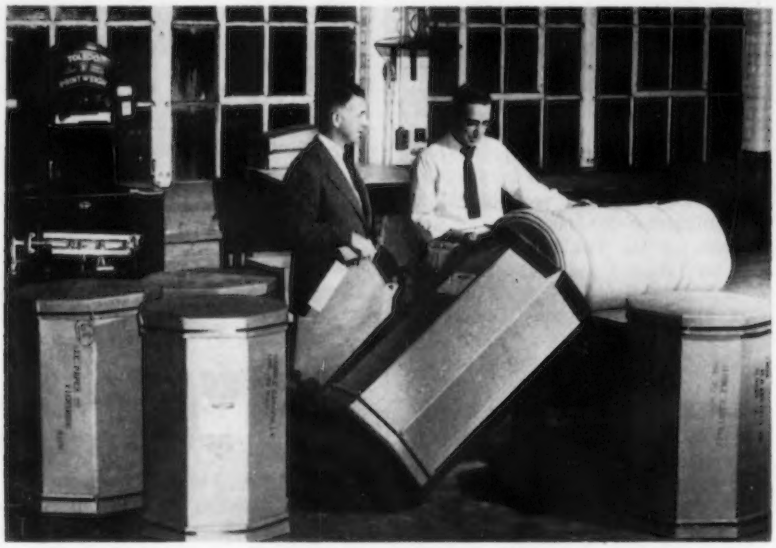
The new company will manufacture and sell mutiwall paper bags, paper pockets, elastic multiwall bags, waterproof paper-lined bags, textile and burlap bags, canvas products, cotton picker bags, brattice cloth, and paper specialties.

Bernard A. Mitchell, Atlanta, chairman of the executive committee of Fulton Bag and Cotton Mills, said the sale was pursuant to the corporate policy of reducing its investment in branch bag plants to give greater emphasis to its integrated Atlanta operations.

Rasmussen Moves to Continental Can

R. J. Rasmussen has been named Continental Can Co.'s folding carton sales representative in San Francisco, Calif., with offices in the Russ Building.

Mr. Rasmussen comes to Continental from the Flintkote Co. where he worked since 1946 as a packaging engineer. Well acquainted with the folding box, set-up box and corrugated industries, Mr. Rasmussen was instrumental in the development of two folding boxes which have been recognized with merit awards in national folding box competitions.



Demonstrating the new packaging at Albany Felt Co. are James E. Smith, sales manager, and John E. Roberts, shipping room foreman.

Corrugated Replaces Burlap for Shipping Felts

After nearly a year of testing various types of containers and special packages, Albany Felt Co. is now standardizing on a patented, steel-strapped, corrugated container for shipment of its paper machine felts.

This is a rugged octagonal-shaped container, developed in conjunction with Gaylord Container Corp. and considered to be a revolutionary application of corrugated cartons for this type shipment.

Not only does the new package provide better protection for the felt in transit than the burlap wrapping commonly used in the industry today, but it also permits better handling, storing and moth damage prevention in the paper mill. The new containers are made in several sizes to accommodate a wide range of different sized felts.

SOLAR BLUES

BRIGHT FAST UNSURPASSED FOR TINTING WHITE PAPER

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A SALES DIVISION OF

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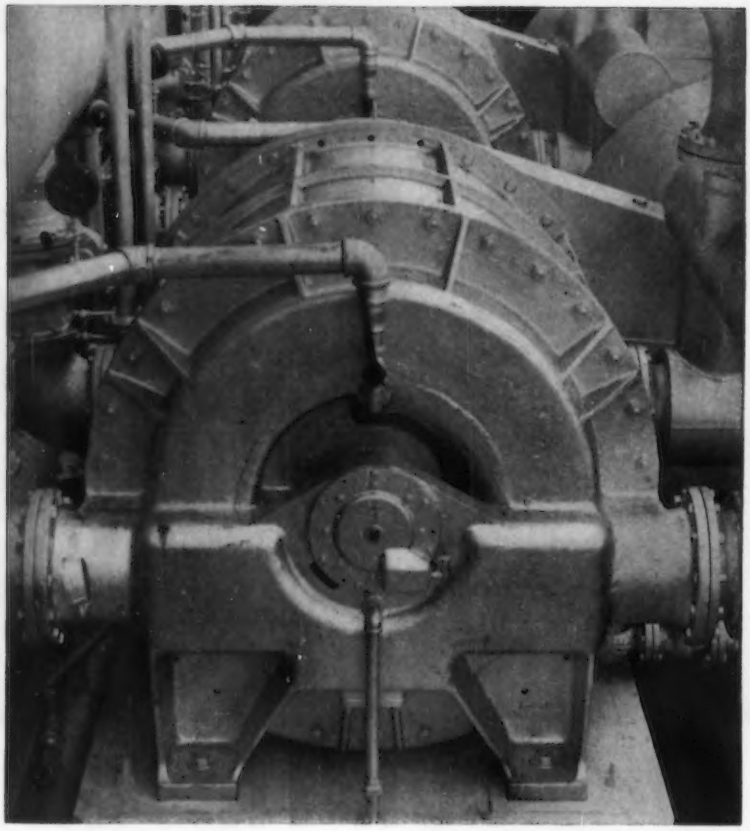
SOLAR BLUE DYES MANUFACTURED BY THE GENERAL ANILINE & FILM CORPORATION ARE SOLD OUTSIDE THE UNITED STATES UNDER THE TRADEMARK "TINTOFEN."

High machine speeds? High temperature headbox stock? You need NASH Vacuum Pumps!



Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

441 WILSON ROAD, SO. NORWALK, CONN.

NEW EQUIPMENT

Splice Troughed Conveyor Belts Easily

A new, easy-to-use, high-strength flexible lacing for troughed conveyor belts has been developed by General Splice Corp. Designed for quick, simple installation, the heavy duty, hinge-type "Minet" splice is said to eliminate the need for templates, drilling or hole punching. A unique design permits installation of the splice in one piece. As the conveyor operates, the hinge plate separates into sections at pre-scored notches to conform with conveyor trough curvature. The one-piece design assures closest possible fit resulting in a tight, leakproof yet flexible joint.

High strength (up to 68 per cent of belt tensile limit) is due to the method of fastening which employs pointed rivets which separate but do not cut and weaken the belt fabric. The hinge-type splice with heavy duty, reusable cable pin, can go smoothly around small diameter pulleys and makes adding and removing belt sections a quick, simple operation.

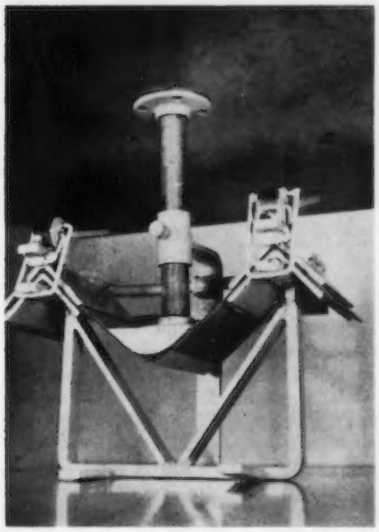
Available for belts from 3/16 to ¾ inches thick and up to 60 inches wide, the splice meets a wide variety of applications. Write to General Splice Corp., 85 Spring Street, So. Norwalk, Conn.

New Hot Melt Adhesive

A new hot melt adhesive formula, Thermogrip 306, having great affinity for certain treated papers, is available from United Shoe Machinery Corp. The adhesive is supplied in cord-like form ¼ inch in diameter and coiled on reels. It is designed for application with their special feeding and melting

device that can be attached to various types of packaging and continous feed converting machinery. The cord-like form of adhesive is used to permit melting at the time and point of use thus avoiding a prolonged melted state which would degrade the quality of the adhesive.

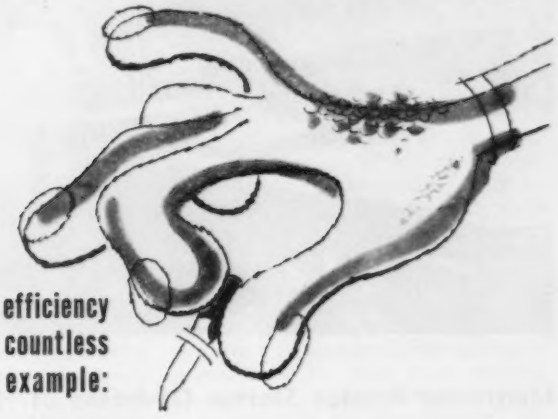
For more information write United Shoe Machinery Corp., Boston 7, Mass.



Machine Tests Box Joint

Testing Machines, Inc., 123 West 64th St., New York, N. Y., has been appointed by the Bathurst Power & Paper Co. Ltd., as the sole manufacturer and distributor of the device invented by that firm which is used in determining the strength of the manufacturer's joint in corrugated containers. This device exerts a force upon the manufacturer's joint similar to that experienced by the container when actually carrying a full load of canned goods. Much valuable information can be obtained regarding the ultimate strength of the box by using this device. A six-inch wide sample of the manufactuer's joint is normally tested and the device is used in conjunction with the compression tester. Extensive investigation on the part of the Bathurst organization shows that by means of this test, a better corrugated carton can be manufactured and damage losses reduced.

DOW CORNING
SILICONE
DEFOAMERS



have proved their efficiency and versatility in countless applications. For example:

1 OUNCE KILLS FOAM IN . . .

62,500 lb
Black Liquor
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Alcohol Coating Varnish

6,250 lb
Paper Color Coating
Paper Size

1,250 lb
Printing Ink

Just a few drops of a Dow Corning SILICONE DEFOAMER can prevent mountains of foam . . . enabling you to utilize full productive capacity and put your processing into high gear. What's more, when you control foam, you eliminate the mess and waste of spillovers. Whatever *your* foaming problem, a Dow Corning SILICONE DEFOAMER will help solve it at amazingly low cost.

FREE SAMPLE and INFORMATION—
To receive a generous trial sample of a Dow Corning Silicone Defoamer, return coupon below or write on your letterhead. No obligation, of course.

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NAME _____

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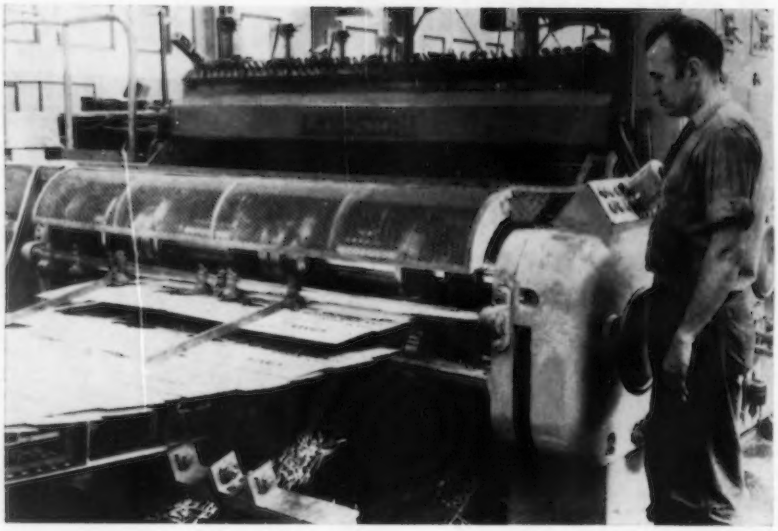
CITY _____ ZONE _____ STATE _____

My foamer is

Oil system _____

Aqueous system _____

Other _____



Multicolor Printer Slotter Operates at High Speed

Increased speed and better quality four-color corrugated work are claimed for the recently introduced printer-slotter manufactured by Samuel M. Langston Co. Now in operation at plants of the Owens-Illinois Glass Co., it is reported that the new machine has doubled the speed of four color work and improved quality of printing on containers.

Front feed rolls on the machine can be adjusted by hydraulic pressure easily and quickly to suit different corrugated grades and sheet sizes. The hydraulic loading eliminates the need for making changes by hand, provides constant pressure and prevents loss of caliper. The feed rolls are geared together on both ends to avoid deflection by torsion and to assure square feed of the blanks.

Once the setup is locked into place, perfect register is obtained at high or low speeds. All printing, slotting and scoring sections are driven from a common splined shaft, eliminating the chance of backlash that exists with conventional gear train drives. Air clutches and hydraulic drives minimize use of gears, wearing of parts and the problem of maintenance. At the end of a run, the radial register at each station can be automatically and simultaneously returned to zero, saving time and eliminating the possibility of error encountered by manual and individual return to zero.

For more information write Samuel M. Langston Co., 6th and Jefferson, Camden 4, N. J.

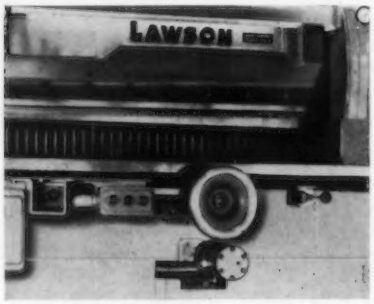
Spray-Dried Pigment Saves Space

A new spray-dried form of Zeolex 23 reported to save more than 20 per cent in shipping and storage space is now in production by J. M. Huber Corp. It is said to be easier to handle: the tiny beads pack tighter, are less dusty and freer flowing than powdered Zeolex.

Zeolex 23 is a widely used white reinforcing pigment for sole and heel and light-colored mechanical goods. It is also used by the paper industry as a brightening agent. Complete information may be obtained from J. M. Huber Corp., 100 Park Ave., New York 17, N. Y.

New Cutters Highly Accurate

Positive clamping control that will not permit the knife to move before full pre-selected clamping pressure has been applied, is the outstanding feature of the new Lawson Series V-65-H 46″,



52″ and 55″ hydraulic clamp cutters. An electro-hydraulic operated clutch and brake combined with an exclusive pressure interlock system enables the operator to select the correct pressure for each type of stock. According to the manufacturer, the result is exceptional cutting accuracy with increased productivity.

The pressure adjustment on the Lawson Series V65-H is variable, and can be changed by the operator for each type of stock to be cut. Because of the exclusive pressure interlock system, the knife cannot start to cut until the full pre-selected clamping pressure is applied. Lawson engineers state that this positively prevents the sheets from shifting out of alignment, and assures that each cut is straight and smooth from top to bottom.

The electro-hydraulic clutch operation enables the operator to put the cutter into action with a simple upward flip of the two-hand operating levers. Both levers must remain engaged until the cut has been completed. Releasing either lever causes the knife to stop instantly. An optional two-hand start, one-hand hold can be applied to the Lawson Series V-65-H. This permits the left hand to remain free to prevent spilling when cutting narrow labels.

More information may be obtained from E. P. Lawson Co., 426 West 33rd St., New York 1, N. Y.

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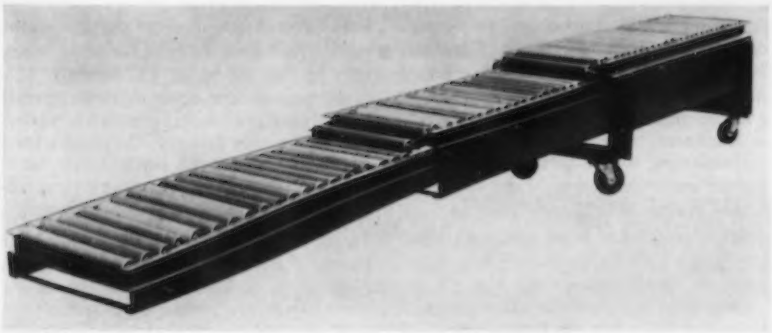

Telescoping Conveyor Simplifies Work

Loading and unloading vans and trucks is accomplished easier, faster and with fewer personnel with new, cantilever telescoping conveyors manufactured by the Wilkie Company of Philadelphia, Pa.

These Wilkie conveyors are available in two or three telescoping cantilever sections. The first section rests on the floor dock or truck-bed, the telescoping sections may be extended with an easy pull. The two-section model extends up to 18 ft., the three-section, up to 30 ft. The cantilever construction is ideal for loading and unloading shorter vans and drop-frame trucks. They speed and simplify work at the pay-off ends of conveyor systems.

The absence of legs beneath the extended sections makes this unit easy to maneuver inside the body of trucks . . . first section is supplied with casters if required. Capacity is as high as 100 lbs. per foot. The conveyors are manufactured in 12, 18 and 24 inch widths, can be supplied with wheels or rollers and, if gravity operation is not ideal, they can be supplied with live roller and power belt.

For complete data and prices, write Wilkie Company, 5520 Arch St., Philadelphia 39, Pa.

New Vinyl-Acrylic Coating for Paper

A new vinyl-acrylic copolymer coating emulsion developed especially for the paper industry is now being marketed by National Starch Products Inc., 270 Madison Ave., New York 16, N. Y. Possessing excellent film flexibility and strength, Resyn 2203 is characterized by low viscosity, superior pigment binding ability, excellent film clarity, and good mechanical stability. The dried film is virtually odor free. In addition to developing excellent film strengths and printing qualities in publication grades of paper, the functional characteristics possessed by the resin latex make it adaptable for use in protective coatings.

According to the manufacturer, the new resin has a strong affinity for cellulose fiber, and coatings containing relatively small amounts of the resin are

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For more than 50 years Magnus Metal has been specializing in custom-built valves for the paper-making industry. These valves are designed and built to meet your exact requirements, whatever they may be — for any of the following types: Blow, Gate, Globe, "Y", Swing Check or Safety Pop.

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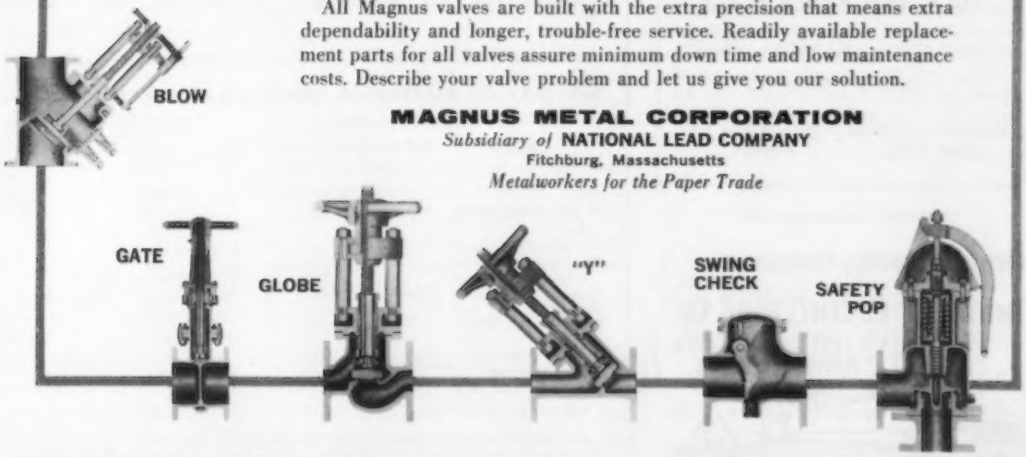

Also a complete line of SCREEN PLATES — Chrome-Nickel-Steel • Inconel • Bronze

firmly anchored to the coating substrate. It can be utilized for all types of coated paper from offset and letterpress stock to light weight wraps and boxboards. For example, in the field of offset printing, where base stocks are coated at the size press or machine coaters, Resyn 2203 is recommended to obtain substantial increase in the coating strength and wet rub resistance necessary for this printing process.

Faster, More Economical Boxboard Press

Boxboard container sheets may now be printed more rapidly and economically by the new Mann-Offset Boxboard Press, specifically designed for container work. Introduced by American Type Founders Co., Elizabeth, N. J., the new two-color press has a maximum board size of 30½" x 43½" and can handle board stock up to .032" in thickness.

According to the company, in printing cartons on the new Mann boxboard press, savings of 20 per cent in production costs have been achieved, when compared with conventional letterpress methods. Production on ice cream, butter, food, and similar cartons ranges from 4200 to 4500 per hour, depending upon quality of stock. First class halftone reproduction, even on four-color work which goes through the press twice, may be had on up to 133 screen.

All presses are equipped with special heavy duty pre-loader, continous feeder, and continuous delivery. On presses used exclusively for card stock from .020" to .032", forwarding cams and tape roller speed is increased for maximum efficiency. The 30½" x 43½" maximum board size is said to make the press ideal as a complement for the Bobst Autoplaten and other die cutting and cold waxing equipment which usually takes a 30" x 42" board.

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Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1958	Dec. 7 90.6	Dec. 14 91.2	Dec. 21 92.0	Dec. 28 49.4r	Jan. 4 72.6
1957	Dec. 8 99.3	Dec. 15 98.4	Dec. 22 99.3	Dec. 29 66.7	Jan. 5 85.4

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	—	—	—	—	—	—	—	—	—	—	—	—	—
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	89.8‡	81.4‡	90.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	—	—	—	—	—	—	—	—
Year Average	98.0	88.6	92.3	91.6	94.9	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Ass'n.

COMPARATIVE WEEKLY SUMMARIES

1958	Dec. 7 84	Dec. 14 92	Dec. 21 93	Dec. 31 45	Jan. 4 51
1957	Dec. 8 95	Dec. 15 95	Dec. 22 96	Dec. 29 52	Jan. 5 75

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	—	—	—	—	—	—	—	—	—	—	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

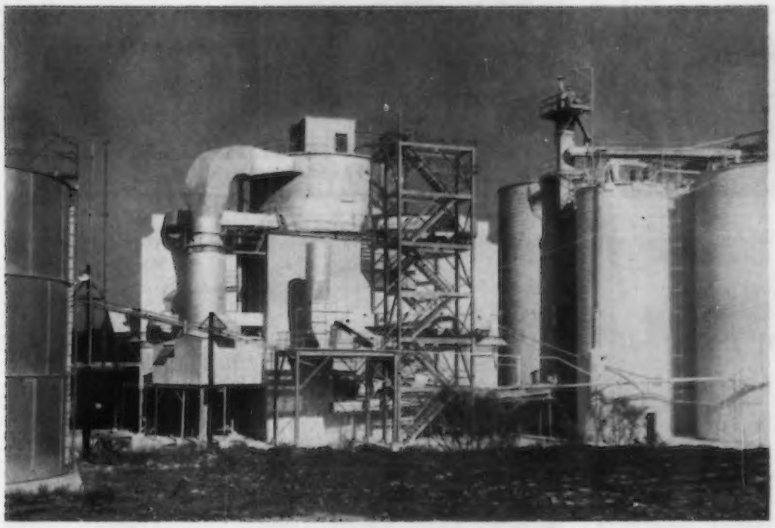
† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Jan. 4, 1958**	LAST WEEK ENDING Dec. 31,1957*	CUMULATIVE TO DATE Jan. 1 to Dec. 31, 1957
% Activity	51%	45%	90%
	Tons	*Tons*	*Tons*
Total Production	54,423	213,154	14,146,504
Liner	18,785	56,886	4,784,986
Corrugating Material	10,356	33,988	2,189,239
Chip & Filler Board	751	4,163	281,223
Total Containerboard	29,892	95,037	7,345,448
Folding	8,860	45,963	2,668,709
Set-Up	1,460	6,706	569,995
Special Food Board	4,436	28,321	1,231,541
Other	9,775	37,127	2,330,811
Total Boxboard	24,531	118,117	6,801,056
Total Orders	*Tons*	*Tons*	
Received	89,692	307,873	
Unfilled End of Week	414,959	376,218	

** Please note period covered is shorter than regular week
* Please note period covered is longer than regular week

NEWS OF SUPPLIERS



Spray Drier at Huber Clay Processing Plant

Huge new spray drier is now in operation at J. M. Huber Corp.'s Huber, Ga., clay processing plant. The new unit triples Huber's spray drying capacity. Spray dried clays unload easier from hopper cars and disperse more readily in water than conventionally dried clays. Another smaller unit has been in operation at Huber since June 1954.

Ross Midwest Fulton Corp., Dayton, Ohio, a subsidiary of the J. O. Ross Engineering Corp., New York, N. Y., announces the appointment of Robert M. Cook as vice president and general manager. He has been associated for many years with automatic temperature control and condensate drainage systems for paper machines.

D. T. Barry

Stowe-Woodward has promoted David T. Barry, formerly director of marketing, to the newly-created position of general sales manager. He will supervise and administer all sales functions for the company's three divisions, the custom rubber-covered roll division which manufactures rolls for the paper and textile industries; the specialized molded rubber parts division; and the Ebonite Tornado bowling ball division.

J. K. Moffett

V. C. Walling

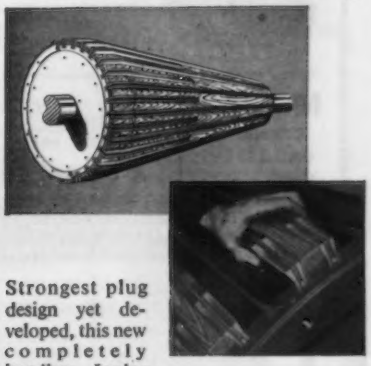
U. S. Industrial Chemicals Co., Division of National Distillers and Chemical Corp., has appointed John K. Moffett Jr. assistant manager of Petrothene polyethylene sales.

He has been supervisor of the company's sodium peroxide plant, head of sodium peroxide sales and at the time of his new appointment was in a sales development position for Petrothene polyethylene sales.

Virginia Smelting Co. has appointed Victor C. Walling, Kirkland, Wash., to its sales staff. Mr. Walling will represent the industrial, refrigeration and aerosol sales departments in Washington, Oregon, Idaho, Montana and Utah.

TIME FOR REPLACEMENT?

E.D. Jones® Adapta-Plug



Strongest plug design yet developed, this new completely bandless Jordan plug is easiest to strip and fill. New, improved design holds bars firmly in place, eliminates hazards of slot wear and corrosion. Available in solid plug — or sleeve form for easy conversion of old worn plugs. Write for Bulletin EDJ-1094.

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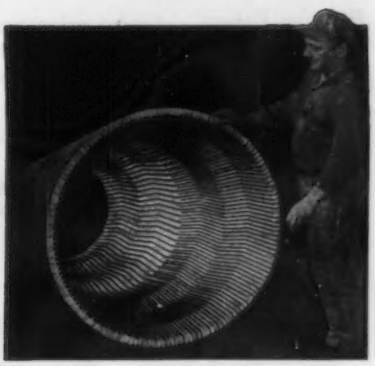
FULBAR

SHELL FILLINGS



A complete one-piece assembly, made to fit the shell body of any Jordan. No keys or wedges. Fulbar rigidity and one-piece construction compensate for inequalities in old Jordan shells — save hours of installation time. Many other new advantages make this the ideal shell filling. Write for Bulletin EDJ-1094 and names of satisfied users.

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He had paper mill panic, due to substandard brushes beat-up bristles, downtime delays, etc., — Now his problems are solved . . . he's saving time and money with economical Jenkins' METLKOR brushes . . . they do a better job and last longer.

Specify Jenkins' METLKOR — the original — the best Metal-Core Brush

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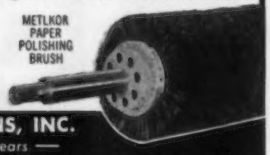

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W V

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Bristols . . . Index, post card.

Converting Papers . . . Label, tablet, envelope, lining, tabulating card, coating raw stock.

Bleached Boards . . . Cup, coated and uncoated carton boards, converting and barrier boards, file folder and tag stock.

Kraft Papers . . . Bag, multi-wall sack, envelope, asphalting, gumming, interleaving, waxing.

Containerboard . . . Linerboard and corrugating medium.

Market Pulp . . . Bleached and unbleached sulphate.

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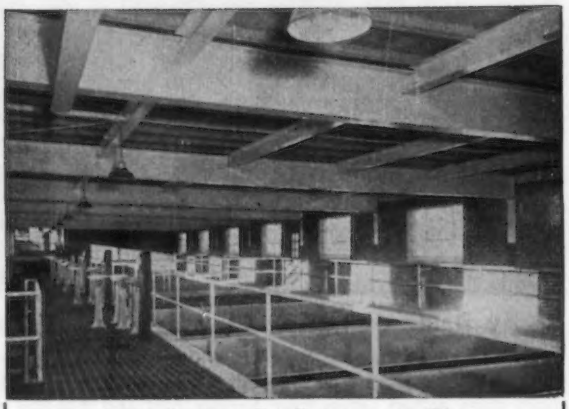

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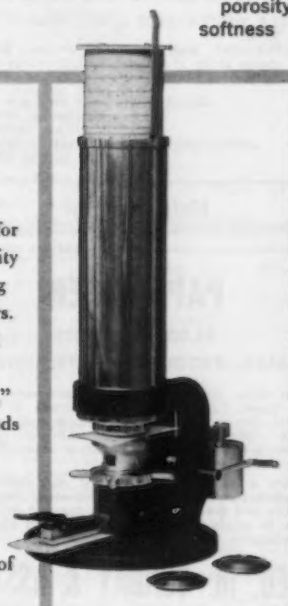
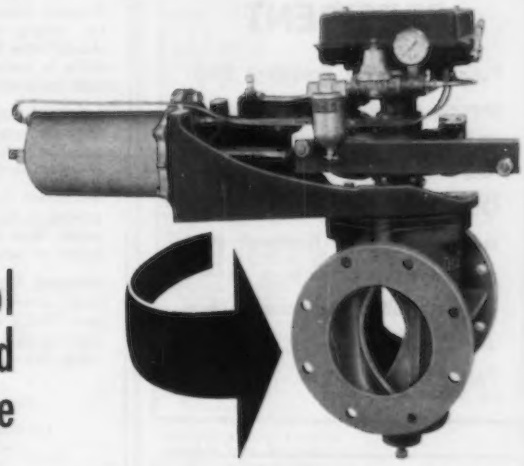
1 INSTRUMENT *for Testing* smoothness porosity softness



Simply interchanging the lower test plates of the Gurley-Hill S-P-S Tester converts this instrument for testing smoothness, porosity or softness of any printing and most industrial papers. Meets TAPPI and ASTM "Suggested Method for Determining Smoothness," as well as standard methods for finding air resistance or porosity.

Write for Bulletin 1400, describing complete line of Gurley paper testers.

W. & L. E. Gurley, *520 Fulton Street, Troy, N.Y.*



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With disturbances from packed stock eliminated . . . with their extreme sensitivity, instant response and freedom from backlash, DeZurik Automatic Control Valves deliver the most rigid, most accurate control possible.

Flow characteristics are determined by a cam in the positioner. Any desired flow pattern can be obtained easily and quickly by changing the cam.

Air cylinder operators have "O" ring piston construction. Inserted in a non-metallic material on the periphery of the piston, the "O" ring assures maximum seal and longevity.

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I am a paper man myself. If your record of performance entitles you to increased responsibility and greater potential, I can and will help you to attain it. You may contact us in absolute confidence.

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1—66" foreign built Rotogravure press, prints 6 colors 1 side, or 4 colors 1 side and 2 reverse, or 5 and 1.
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1—31½" 4-Color Heinrich Flexographic Press.
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1—30" Kidder 6 station Flexographic press
1—26" 4 color Kidder Flexographic.
1—25" 8-Color Flexographic Press.
1—24" 4-color Kohlbach Flexographic
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1—32" 2-color 8 pitch.
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1—72" & 1—84" Potdevin squeeze roll waxing mach.
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4—Hamblet Sheeters, 42", 54", 84" & 100"
1—36" Beck Model CSH Sheeter with Automatic Piler
1—36" Beck Sheeter Model CCSH, suitable for cello.
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1—#81 Potdevin SOS Bag Machine.
1—#104 Potdevin F & S Bag Machine.
4—Roto PO-2 Poly-bag machs.
1—Roto Model C Cellophane Bag machine
1—Matador Bag machine. Length 3½"—10½", Width 1⅛"—6".
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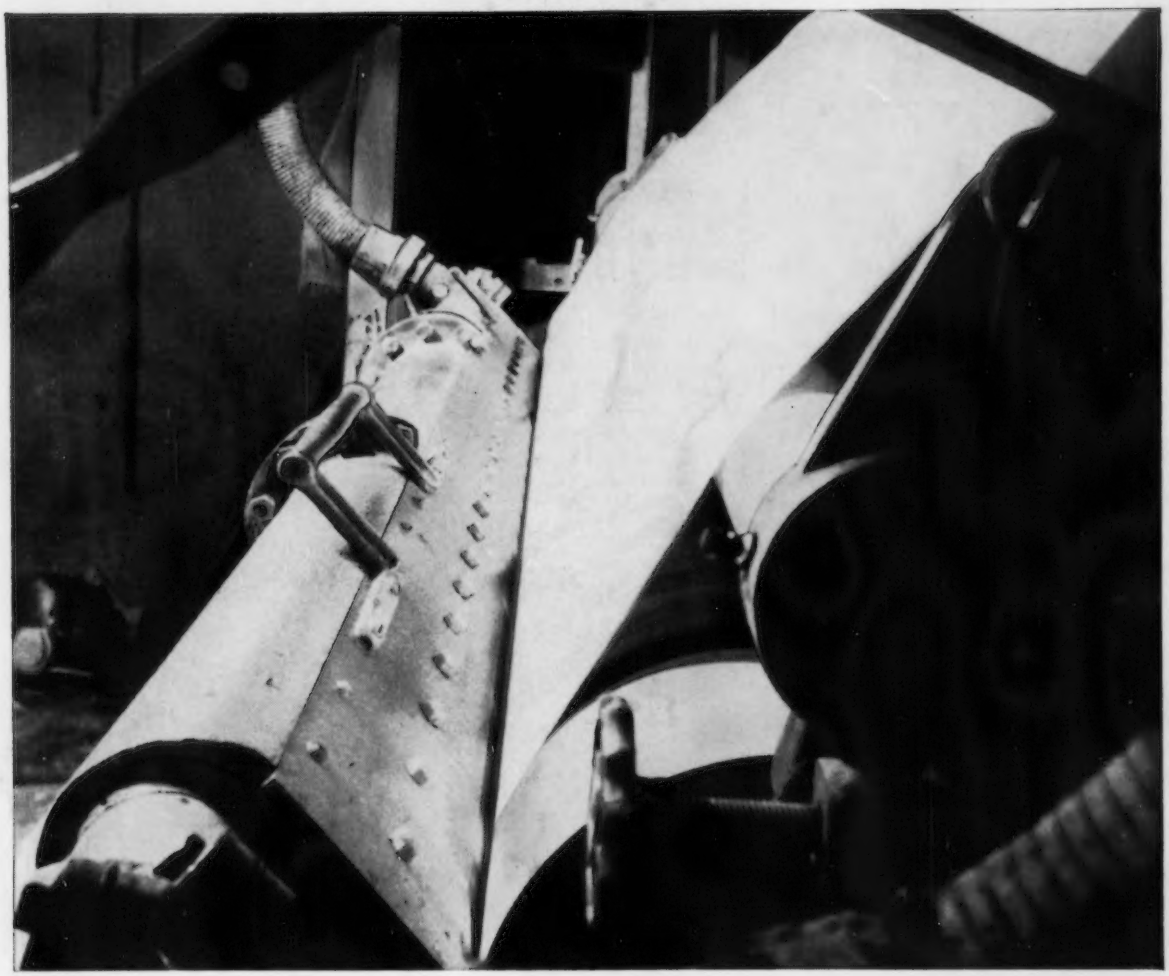

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